DOCUMENT RESUME

ED 224 459 IR 010 440

AUTHOR	Froke, Marlowe, Ed.; And Others
TITLE	Telecommunications and Higher Education. Occasional Paper No. 3.
INSTITUTION	Pittsburgh Univ., Pa. Inst. for Higher Education.
PUB DATE	81
NOTE	101p.
AVAILABLE FROM	Institute for Higher Education, University of Pittsburgh, Forbes Quadrangle, Pittsburgh, PA 15260 ($5.00).
PUB TYPE	Viewpoints (120) -- Speeches/Conference Papers (150)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Adoption (Ideas); Change Strategies; *Decision Making; Educational Innovation; *Educational Trends; *Higher Education; Institutional Cooperation; Lifelong Learning; *Technology Transfer; *Telecommunications

ABSTRACT

The first of the three papers which set the theme for this monograph on telecommunications is an examination of the implications of telecommunications developments for the learning society by Michael B. Spring. Marlowe Froke then looks at telecommunications development in institutions of higher education and discusses institutional change that might allow effective use of the new technology. Finally, Walter Radzyminski addresses the opportunities and obstacles higher education will need to consider in deciding whether or not to use cable telecommunications technology in planning for institutional futures. Several respondents provide formulated statements reacting to one or more of the initial three papers. These responses include perspectives from the cable industry, from a small university's telecommunications efforts, and from the development of a 10-institution consortium agreement. Other topics covered are the commitments necessary to participate in the telecommunications revolution, issues and trends considered in the principal papers, life-long learning issues, and institutional considerations. John C. Weidman provides a summary of the monograph and makes some concluding observations. (Author/LMM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED224459

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☛ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

Occasional Paper No. 3

TELECOMMUNICATIONS AND HIGHER EDUCATION

Edited by

Marlowe Froke
Walter Radzyminski
Michael Spring

Institute for Higher Education
University of Pittsburgh
5501 Forbes Quadrangle
Pittsburgh, PA 15260

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Institute for Higher Education

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Copyright © 1981 by the Institute for Higher Education
University of Pittsburgh

All rights reserved. No part of this report may be reproduced by any means without prior written permission.

IR010440

TABLE OF CONTENTS

Foreword. i
Wesley W. Posvar

Introduction. iii

Telecommunications and the Learning Society 1
Michael B. Spring

Educational Telecommunications and Institutional Change . . . 29
Marlowe Froke

Cable Communications: Some Considerations for Academic Planners. 53
Walter Radzyminski

Contributors:
Educational Programming on Cable: Making It Happen. 63
Gerry Jordan

Yes Virginia, There is a Telelecachronacompucommunications Revolution Taking Place 67
Herman Niebuhr, Jr.

Perspectives. 70
Lorita S. Langdon

They're Ready...Are We? 73
Randall G. Bretz

The Relationship of Academe to City Cable TV. 76
Joseph G. K. Miller

Reflections on Telecommunications, Federal Initiatives, and Academic Responses to Technology. 79
Susan Fratkin

A Case Study in Telecommunications and Higher Education: The To Educate the People Consortium. 85
Otto Feinstein

Telecommunications and Higher Education: Problems and Prospects 89
John C. Weidman

About the Authors and Contributors. 92

FOREWORD

For over twenty years educators have listened to those from our own ranks and from the ranks of the emerging technologies, now commonly lumped together as telecommunications, predict the coming revolution in education.

While stunning technological developments have taken place which have enhanced capacity to create, transmit, store and retrieve information along with a visual and sound record of experiences, the revolution predicted for education has been slow to materialize, though changes are underway.

What follows in this monograph represents less of the exhortations of the long predicted revolution and more of a reasoned review of developments from a variety of perspectives.

The authors have gone somewhat beyond the discussions of the promise of the new technologies and have offered a more thorough analysis of the implications for education.

No single new technology, whether it be cable television, microcomputers or video discs will provide the solution to higher education's problems which we must face in the 1980s and beyond. However, the authors have provided an interesting look at some alternatives which educators need to be aware of if we are to meet our responsibilities in considering realistic options in planning for the future. Neither telecommunications nor any other single idea will represent more than a part of the answer to the challenges of doing a better job of providing education with diminishing resources, but to ignore or fail to understand how this tool might help us would be irresponsible. Back in 1974, the foreword to Cable Television and the University, included this thought, "...it is important for colleges and

universities to be aware of the opportunities and challenges presented by this technology." It may be far more important in 1981.

There is considerable interest and a good deal of confusion regarding the rapidly changing developments in the telecommunications field. The authors of this monograph have made what I believe to be a reasonable effort at helping us to understand better what some of this change might mean to us.

I am pleased that the University of Pittsburgh's Institute for Higher Education is able to provide this forum for a discussion of the promise telecommunication may provide the higher education community. As one who has had a continuing interest in educational applications of telecommunications, I am particularly pleased to see the subject given the kind of treatment this current monograph presents.

Wesley W. Posvar
Chancellor
University of Pittsburgh

INTRODUCTION

This monograph has been prepared under the auspices of the Institute for Higher Education at the University of Pittsburgh and is an outgrowth of a seminar sponsored by the Institute in the Fall of 1980.

Three papers establish the thrust of the monograph. Michael Spring, Acting Director of the University External Studies Program at the University of Pittsburgh, begins with an examination of the implications of telecommunications developments for the "learning society." Marlowe Froke, Director of Media and Learning Resources at The Pennsylvania State University, looks at the development of telecommunications in and around institutions of higher education and discusses the broad parameters of planned institutional change that might allow effective use of the new technology. Finally, Walter Radzyminski, Graduate Student Assistant with the Institute, then addresses the question of the opportunities and obstacles that higher education will need to consider in addressing the question of whether or not they will employ cable telecommunications technology in planning for institutional futures.

A number of individuals have reacted to the papers by formulating statements or responses to one or more of the papers. In choosing respondents, the emphasis was placed on selecting a diverse group of individuals who could look at the issues from a variety of perspectives. We sought critical thinkers from throughout higher education and the telecommunications industry. Gerry Jordan, National Director of Educational Programming for Warner-Amex Cable Corporation, provides an industry perspective. Having extensive background with QUBE and sophisticated cable technologies, he articulates a practical agenda educational institutions might adhere to if they want to

ensure a presence on cable systems. Herman Niebuhr, Vice President of Temple University, contributes as one who is deeply concerned with renewal strategy and sound institutional planning. His provocative perspective questions change capability. Lorita Langdon, Chairperson of the Communications Skills Department at Columbus Technical Institute (CTI), provides a commentary from the perspective of telecommunications effots at a small institution. She shares some of the attitudes toward and utilizations of technology that CTI has developed.

Many telecommunication efforts require efforts too large to be undertaken by institutions operating on their own, but rather require institutions working cooperatively. Having worked extensively with consortial arrangements, Randy Bretz, formerly with the Indiana Higher Education Telecommunications Service, and currently Director of Mediated Instruction at the University of Nebraska, considers some of the commitments necessary of higher education if it is to participate in the telecommunications revolution. Joseph Miller, Director of the Pittsburgh Council for Higher Education, looks at the issues in light of his recent experiences overseeing the development of a ten institution consortium agreement.

Issues, trends, and other educational preoccupations considered in the principal papers are reviewed with more of a federal flavor by a representative from a national higher education association. Sue Fratkin works with telecommunication educational efforts for the National Association of State Universities and Land Grant Colleges. Reflecting on life-long learning issues and institutional considerations is Otto Feinstein, who was a driving force in the development of the television-based Weekend College at Wayne State University. He brings insight from his work with this unique, blue-collar oriented, learning opportunity. Finally, John Weidman, sociologist and Director of the Institute for Higher Education at the University of Pittsburgh, provides a summary of the monograph and makes some concluding observations.

TELECOMMUNICATIONS AND THE LEARNING SOCIETY

Michael B. Spring*

A. INTRODUCTION

Various authors, among them Hutchins in The Learning Society and Kerr in the Carnegie Council's Three Thousand Futures, have proposed that telecommunications, and in particular television, will spur the birth of the learning society. Learners in this new society will engage in learning activities that are heavily dependent on electronic mediation. The following is typical of the end result that is predicted.

> He seats himself in a plastic carrel with a screen in front of him and consoles on three sides. A "Viewdata" magazine on cable channel K scrolls slowly up the screen, listing the evening's programs: there is the required history documentary on channel Q. The boy switches to Q but elects to tape the program on the video cassette recorder--muttering "history is the pits"--and makes a mental note to play it back at doublespeed the following morning just before he leaves for school.
>
> Then he reaches for what looks like a thick, silvery phonograph record, a videodisk, and clamps it into a playback machine that scans it with a laser. Swiveling his chair to the other side of his carrel, he switches on a microcomputer that itself has a pale green screen. He presses a command key on the keyboard and a legend appears on the computer screen: "Which frame would you like to review?"
>
> The boy replies by pressing a five-digit number in the keyboard and as he turns back to the disk player the screen becomes a blur as the disk spins forward to the designated still frame, and a set of multiple choice questions appear. The boy answers the questions on the keyboard, and the computer punches out a card with his score. Then, pocketing the card, he settles back to watch a direct satellite transmission of an Italian soccer match.[1]

---

[1]Hulbert, D. What the Future Will Look Like. New York Times: Education Section, April 20, 1981, p. 1.

*Michael B. Spring is Acting Director of the University External Studies Program at the University of Pittsburgh

Amazingly enough, all the hardware described in this speculative forecast exists today.[2] Further, the cost of installing such a system in a home would not greatly exceed the annual salary (including fringe) of an experienced city school teacher.

Some months ago, I wrote a brief think piece on "Television and the Learning Society."[3] This current article is an outgrowth of the earlier one. It more broadly embraces the question of the interrelation of the booming information/communication industry and the learning society. The interrelation is addressed in four stages. First, telecommunications is described. Second, whether our society is, or is becoming, a learning society is assessed. Third, the current situation is examined for ideas, data, and trends relating to the relationships between the two. Fourth, and finally, a position is developed on the likely relationship between telecommunications and the learning society.

B. TOWARD A DESCRIPTION OF TELECOMMUNICATIONS

A review of literature in the telecommunications field provides little in the way of a satisfactory definition for telecommunications. The dictionary defines telecommunications as "the process by which meanings are exchanged between individuals over a distance through a common system of symbols." The difference between communications and telecommunications would seem only to be the distance over which the exchange of information occurs. Some historical events in telecommunications help to make clearer the

---

[2]Most of the equipment described will be familiar to the reader. The most recent addition is the SONY Video Responder which allows a student to carry forth an assignment based on visuals accessed by computer command controls with the results of the student's effort typed on a card.

[3]Spring, M. B. Television and the Learning Society, Continuing Higher Education, Spring, 1981, 29:2, pp. 21-22.

more common meaning of the term. One of the earliest examples of telecommunications, and one that has had a significant impact upon history, was Moses going to the top of Mount Sinai where a few stone tablets were carved out. He carried them back down (over a distance). The symbols on the tablets communicated meanings that have become central to Western civilization. Gutenberg, with the discovery of printing, began the age of mass telecommunication--large numbers of individuals sharing ideas over long distances. Marconi began electronic telecommunications with the radio; Zworkin created the potential for mass visual electronic telecommunications—the T.V. Combined, these events describe an activity somewhat more complex than simple communication over a distance. One additional component may be added to the expanded meaning of telecommunications developed by these examples.

Prof. Anthony Oettinger of the Aiken Computation Laboratory at Harvard coined the term "compunications" to describe the combination of computers and communications systems.

> A host of developments is being spawned as data communications moves into relationship with other evolving communications technologies. As all the technologies become increasingly available and increasingly affordable, the option arises of combining them in various configurations to create a single integrated information transfer system. Subscribers to such systems can have voice telephone service, facimile, word processing service, access to computers, TV video conferencing, and other types of visual reception and transmission, all flowing along a single telecommunications superhighway.[4]

Thus, telecommunications, as we think of it today is involved with mass, electronic, and computer based exchanges of information.

---

[4]Smith R. L. A Telecommunications Primer for College Presidents, Planning for Higher Education, February, 1979, 7:4, pp. 7-8

With this background, it is possible to more clearly describe what is meant by telecommunications. The term refers to something more than "communications over a distance." It is communications—that is the exchange of meanings between individuals by use of symbols. It is tele—that is, communications over a distance (or where distance doesn't matter). It might be communications across a room or it might be over a great distance, as in a satellite transmission. In most instances, it is achronal—it may be live (microphones or satellite links) or it may be made, stored, and replayed at some later date (audio and video tapes). Telecommunications is thus more accurately described as tele-electronic-achronal-communications. Taking Oettinger's observation in hand, the notion of computer mediation should be added. With computer mediation, the expanded term becomes tele-elec-achrona-compu-communications or TEACC.

Simple examples of TEACC exist today in the form of hand held translation computers that can be purchased for about $300. They provide a common example of TEACC--you punch in one thing, something else comes out; it's a process by which meanings are exchanged between individuals via the use of electronically processed symbols. It may be over a distance if they are connected by a line or by a microwave and it may be over time if they are stored and then transmitted. It is clearly computer mediated. Electronic mail provides another example. Institutions, universities, and corporate entities are now investing in the processing of mail through computers, the information is displayed on a video screen. These are examples of telelecachronacompucommunications as it exists today—the process of non-time or space bound electronically processed and transmitted exchanges of meanings between individuals using a common system of symbols.

There is a further component of modern TEACC beyond the scope of this paper. It is brought to mind by a show called "Sunday Morning." On that show, during the last five minutes or so, a camera is put out in a woodland, on a shore, or in a marsh. A microphone is put on top of a camera and both are turned on. (Imagine for a second that no editing is done.) The segment is broadcast across the United States a few days later. This use of the media raises a question. Is it a use of symbols to communicate meaning between individuals? Or is it not, in shows like the National Geographic Specials, the Voyager I transmissions from Saturn, and the recently broadcast "football game without announcers", the sharing of an experience almost as directly as if we were there? Are these telelecachronacompucommunications or are they tele-experiences? Is there any communication via symbols or are we entering a new era where we will have the opportunity to share an experience across a distance without having it translated via symbols? For purposes of this paper, the discussion is restricted to telecommunications. None-the-less, interesting possibilities exist in the area of "telexperience."

For the time being then telecommunications will be more completely described by the term telelecachronacompucommunications. It is the impact of TEACC, not simply telecommunications. that will be explored.

C. THE LEARNING SOCIETY: AN ASSESSMENT

This section explores two questions. First, what is meant by the term, "the learning society?" Second, is our society becoming a "learning society?" The answer to the first question is not a descriptive answer—there is no learning society to point to—but rather a stipulated answer taken from Robert Hutchins' The Learning Society.

> [The learning society] would be one that in addition to offering part-time adult education to every man and woman at every stage of grown-up life, had succeeded in transforming its values in such a way that learning, fulfillment, becoming human, had become its aims and all its institutions were directed to this end.[5]

There can be little disagreement with the definition stipulated by Hutchins. The more pertinent question is whether or not the U.S. is, or is becoming, a learning society. A somewhat presumptuous part of the question has to do with what the all powerful education system can or will do to transform our society into the learning society. To address the first, the broader question, it makes sense to start simply.

A society is a community, nation or broad group of people having common traditions, interests, institutions, attitudes, and activities. It is the focus of the traditions, interests, institutions, attitudes, and activities that give rise to a label for a particular society. Societies sometimes develop common institutions and interests on the basis of the activities in which the majority of the people spend their time. For this reason we have agrarian, mercantilistic, industrial, postindustrial, technological, service, and information societies. If most of the people spend their time in industry or the production of materials, it's an industrial society. If most of the people spend their time in the sale of materials and the exchange of goods, then the society may be mercantilistic.

Societies can also develop common institutions, attitudes, activities and interests based on the form of social governance. This seems to be a common source for a label for a society. Societies may be theocratic, feudal, oligarchic, monarchal, totalitatian, democratic, socialistic, capitalistic, communistic, technocratic, or bureaucratic. Finally,

---

[5]Hutchins, R. L. The Learning Society. New York: Mentor Books, 1968, pp. 164-165.

societies may develop their common attitudes, interests, activities, and institutions on the basis of the discretionary use of national and personal resources and energy. Thus, if everybody spends their money on having fun, the society is hedonistic. If the nation spends all its money on arms and conquering other nations, the society is mitilaristic. Similarly, societies may be labeled as puritanical, Victorian, utilitatian, leisure, health, or learning. Two questions help to answer the question of what label our society might be given in the future.

1. Where do the people spend their time?
2. Where do the dollars go?

1. Where do we spend our time?

Chart 1 shows how, on the average, time is distributed among various activities over a week's duration.[6] The most time is spent in sleep and rest—maybe we're a sleeping society! The second largest amount of time is spent in work. Neither of these time absorbers come as much of a surprise. However, third on the list is a category that wasn't there 40 years ago. The third largest absorber of time is TV viewing (12 hours). Activities such as education (1 hour), conversation (2 hours), and child care (2 hours) absorb comparatively little time. The most recent data suggest that television viewing today accounts for 18-22 hours of an adult's waking time. This is a tremendous amount of time when one considers that 40 years ago it wasn't even on the list. The data are more impressive still considering that over that same period other uses of leisure time grew hardly at all. Significantly more time is not spend on reading, pursuing formal education, or participating in sports. Indeed Slazai indicates that over the last

---

[6]Szalai, A. (Ed.) The Use of Time. Paris: Mouton, 1973, p. 691

15 years there has been a 15% increase in the amount of leisure or free time available to pursue hobbies, participatory sports, conversation, and other free time activities.[7] All of that additional free time has been absorbed in increased television viewing which went up 40% over the same 15 year period. Clearly, television viewing absorbs a tremendous amount of time, and it's on the increase.

CHART 1

TIME USE ANALYSIS

ACTIVITY	HOURS/WEEK
SLEEP/REST	60
WORK	39
TV	12
SPORTS/PARTIES	8
HOUSEWORK	8
PERSONAL CARE	7
SHOPPING	5
TRAVEL TO/FROM WORK	4
READING	3
HOUSEHOLD REPAIRS	3
HOBBIES/GAMES	3
CHILD CARE	2
PARTICIPATORY SPORTS	2
CONVERSATION	2
EDUCATION	1
RADIO/RECORDS	1
MISCELLANEOUS	8
TOTAL	168

[7] ibid, p. 197

2. Where do the dollars go?

There are three ways to look at where the dollars are spent by our society. First, the sheer volume of federal expenditures may be examined. Second, how the expenditures relate to each other may be examined. And finally, the nature of personal expenditures can be examined.

Chart 2 shows the Federal budget outlays over a twenty year period.[8]

CHART 2

FEDERAL BUDGET OUTLAYS

(IN BILLIONS; IN 1972 DOLLARS)

	TOTAL	DEFENSE	TOTAL NONDEFENSE	AID TO STATE AND LOCAL GOVERNMENT
1960	150.8	73.8	77.0	11.2
1965	173.3	69.3	104.0	15.7
1970	220.8	90.3	130.5	27.0
1975	253.4	67.1	186.02	38.9
1979	284.1	68.3	215.9	47.5

They are all reported in 1972 dollars to allow for a direct comparison. The data suggest three things. First, the U.S. is becoming a more bureaucratic society; more money is going into and out of the federal government than was true in the past. Second, the society is becoming more centralized; more state and local funding is being funneled through the federal government. Third, judging by the federal funds expended, it is probably safe to say that the U.S. is becoming less of a militaristic society. (Indeed, federal funds devoted to the military have been going down when constant dollars are considered.) Chart 3 shows this even more clearly.[9] The percentage of federal funds devoted to defense spending has decreased

---

[8] U.S. Bureau of the Census, Statistical Abstracts of the United States: 1979 (100th edition). GPO: Washington, D.C., 1979, p. 255.

[9] ibid, p. 257

significantly over the twenty year period shown. We are becoming a more socialist society in the sense that the percentage of federal funds devoted to income security, health, and education by the federal government have increased significantly. Choosing, based on this chart alone, a label for the U.S. society, it appears apropos to call it a "health society". Indeed, the fact that we are moving in this direction is reinforced by personal expenditure patterns.

CHART 3

DISTRIBUTION OF FEDERAL BUDGET (%)

	DEFENSE	INCOME SECURITY	HEALTH	EDUCATION
1960	49.0	19.8	.9	1.1
1965	40.1	21.7	1.5	1.8
1970	40.0	21.9	6.7	4.4
1975	26.2	33.3	8.5	4.8
1979	23.2	32.2	10.0	6.2
% INCREASE (DECREASE) 1960-1979	(52%)	62%	1011%	464%

In 1940, food, housing, household operations, and transportation accounted for a little more than 70% of disposable income. In 1970 they accounted for a little less than 65% of that income. What has been the change in the pattern of income disposal? Chart 4 shows the more significant categories of change.[10] Personal funds devoted to education have increased slightly--possibly favoring the learning society. Funds expended on TV, radio, records and instruments, have increased at a slightly faster rate. Funds expended on books, maps, newspapers and music held steady and then began to decline in the 70's. (As we enter the 1980's they are projected to decline further.) Medical care expenditures are clearly on the rise

[10]Department of Commerce. Historical Statistics of the United States: Colonial Times to 1970. GPO: Washington, D.C., 1975, pp. 316-319.

as a personal expenditure. (The government is not paying for all the medical care individuals want; individuals are paying for it too.)

CHART 4

CONSUMPTION EXPENDITURES
(AS A PERCENTAGE OF TOTAL CONSUMPTION)

	EDUCATION	TV, RADIO RECORDS INSTRUMENTS	BOOKS, MAPS, NEWSPAPERS, MUSIC	MEDICAL CARE
1970	1.6	1.5	.8	7.6
1960	1.1	1.0	1.1	5.9
1950	.8	1.3	1.1	4.6
1940	.9	.7	1.2	4.3

While it may be overly cynical to reduce the question of a label for society to time and money, the indications do seem to ring true. A number of other approaches appear to yield similar conclusions--for example, we would expect that our most important institutions would be housed in our most impressive structures. If architectural design is considered, then the most important institution is government. If size is considered, then the most important institution is either business or sports. However, if one considers the most impressive and important major structure in "new" local communities (suburban complexes), is it not the local community hospital?

As Hutchins suggests, our society has become something of a leisure society in that there is more time at the disposal of individuals.[11] It also has to be admitted that television has risen to a place of significant importance in our lives—one might even say a place of unprecedented dominance.

---

[11]Hutchins, op. cit. pp. 162-163.

Finally, it is reasonable to suggest that the pre-eminent absorber of personal and national resources is the health industry with social security and education coming in a strong second. In summary, our current capitalist/time-preoccupied society is changing. The most marked indicators of that change are a growth in leisure-time, absorbed primarily by television viewing, and a preoccupation with an extended and secure life. Reduced to even more simple terms, our society has invested itself in creating, for each member, a massive amount of additional healthy life-time—currently without regard for how that time is to be used.

C. THE CURRENT TRENDS

There are multiple directions in which the U.S. society might develop. The learning society appears to be one legitimate direction. Will telecommunications or higher education have anything to contribute toward promoting the learning society? Hutchins, speaking about television and education in the U.S., suggests the following:

> Such a country, the U.S., will transform new opportunities for education into means for turning out producers and consumers--the dollar again. This has been the fate of television in the U.S. It could have been used for educational purposes, but not in a commercial culture. The use of television, as it was employed in the U.S. in the 1960's, can be put in its proper light by supposing that Gutenberg's great invention had been directed almost entirely to the publication of comic books. What could have been, and what one would naturally have supposed would have been, a great new instrument of enlightenment was largely devoted to selling soap, beer, deodorants, and cigarettes and to entertainment that would keep the viewer riveted to the set between advertisements. As I have indicated, television, together with other cultural forces aligned with it, is enormously powerful in comparison with anything the educational system can offer. We must therefore ask again, how can cultural change be brought about? If education cannot do it, or education alone, how can it be done?12

---

[12] ibid., pp. 157-158.

What role can or will television and institutionalized education, that is schooling, play in the development of a learning society? Regarding the television component, the Carnegie Commission, in The Public Trust, stated public television's role with respect to the learning society this way:

> We recommend that public broadcasting renew its commitment to provide programs and services which will help fulfill the promise of telecommunications to aid in the education of all Americans throughout their lives. The major responsibility for this effort rests with the stations. [13]

This charge by the Carnegie Commission leaves the final decision to the individual stations. For those public television stations that are franchised as community-based television stations, as opposed to higher education or department of education based television stations, this charge has been a particularly uneasy one. It's been very difficult for them to manage their many diverse missions. Nonetheless public television is on record as committed to promoting learning.

What is higher education doing to promote the learning society? Two statistical views of higher education will serve to elaborate an answer. Chart 5 shows the learning society and its teachers.[14] Universities, colleges, and two-year schools are serving 11 of the 29 million learners identified by the National Center for Educational Statistics. Post-secondary institutions, correspondence, vo-tech, business, other non-collegiate institutions are picking up another million. Adult education, in the form of business-related training and informal church and union-sponsored education, is picking up another 17 million. Formal institutions

---

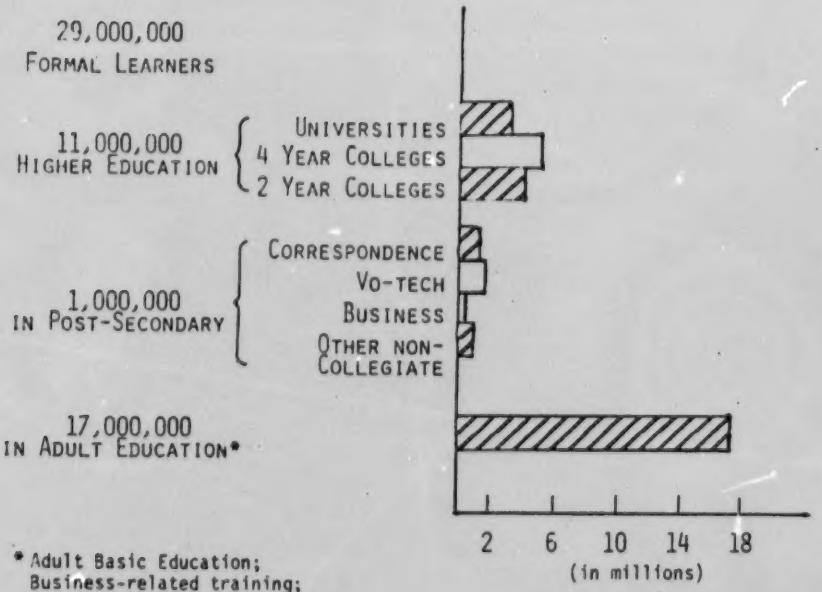
[13] A Public Trust: The Report of the Carnegie Commission on the Future of Public Broadcasting. New York: Bantam Books, 1979, p. 262.

[14] Hodgkinson, H. What Can Faculty in Traditional and Non-traditional Education Learn from Each Other, Proceedings of the Fourth National Conference on Open Learning and Non-traditional study, 1977, p. 10.

are doing a pretty good job—12 out of 29 million. However, coming from the National Center for Educational Statistics (NCES), these statistics are somewhat biased toward organized activities. Stanley Moses, of the Education Policy Research Center at Syracuse, provides a somewhat different perspective.[15] He suggests (Chart 6) that there are 95 million adults engaged in learning activities of all kinds. Excluding those engaged in formal higher education, 84 million adults, according to his study, are engaged in learning activities. Like NCES, he finds 11 million adults involved in formal higher education. Where are the 84 million? They are in business, government, and industry training, proprietary schools, antipoverty programs, correspondence schools, TV-based instruction,

CHART 5

THE LEARNING SOCIETY AND ITS TEACHERS

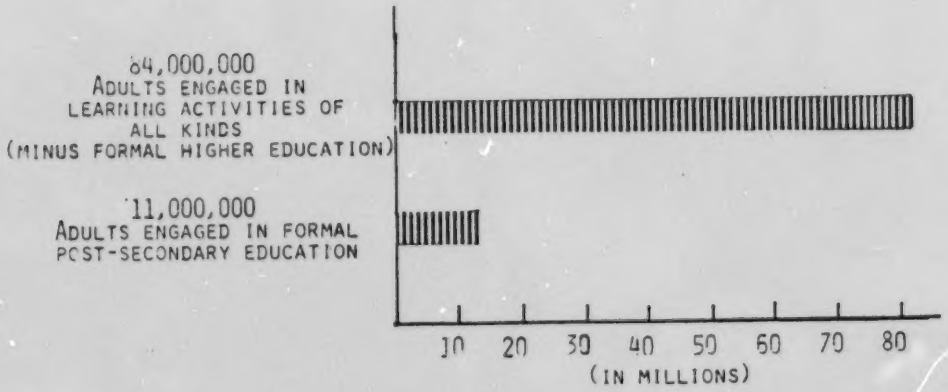


* Adult Basic Education;
Business-related training;
Informal Education;
Church-sponsored;
Union-sponsored.

[15] Moses, S. The Learning Force: A more comprehensive Framework for Educational Policy. Syracuse University: Publications in Continuing Education, Occasional Papers, No. 25, October, 1971, p. 19.

libraries, social organizations, and high school adult basic education programs. From this perspective, higher education is not playing quite so significant a role in the development of the learning society.

CHART 6
THE LEARNERS IN THE LEARNING SOCIETY


64,000,000
ADULTS ENGAGED IN LEARNING ACTIVITIES OF ALL KINDS (MINUS FORMAL HIGHER EDUCATION)
11,000,000
ADULTS ENGAGED IN FORMAL POST-SECONDARY EDUCATION
10 20 30 40 50 60 70 80
(IN MILLIONS)

These charts serve to emphasize that educational institutions may or may not play a role in the development of the learning society. The learning society may be achieved other than through educational institutions.

With these introductory notes of caution, there is more optimistic evidence to consider in relating telecommunications, higher education, and the learning society. In looking forward, eleven factors deserve particular consideration. They may be grouped in three areas: 1. technological developments, 2. educational developments, and 3. developments related to young people.

1. Technological Developments

a. Knowledge, skills, and experiences are cheaper. Avowed eclectics need only examine their collections to understand this. Included among records purchased for less than $3 are copies of live recordings of Lenny Bruce and Billie Holiday. Inexpensive, but high quality copies of da Vinci,

Michelangelo, and Renoir gather dust on bookcases. (I recently purchased a 1965 edition of the Encyclopedia Britannica at a flea market for $15!) An electronic toy for children, called the Sound FX machine, can be purchased, on sale, for $15. The machine allows ten year olds to develop skills in the production of a wide range of sound effects. Perhaps most significant of the wide range of knowledge and skills made affordable by telelecachrona-compucommunications are those made available through television. The impact of Sesame Street on pre-school acquisition of verbal and analytic skills has been well documented. Shakespearian plays, indepth news analyses, and many other learning experiences, for both adults and children, are becoming more readily affordable and accessible through telelecachronacompu-communications.

b. Telelecachronacompucommunications is coming closer to providing a total experience. H. G. Wells' Time Machine provides the ultimate example of immersion in an experience across time (and space if the machine is moved.) Telecommunications, with significant implications related to its potential for the learning society, is coming closer and closer to imitating the total experience. Holographic still photography is a quantum leap beyond stereographs. The fad of 3-D movies will someday give birth to true holographic video. "Sensaround" has provided a taste of the combination of the kinestetic and visual experience. The movie theater at the National Air and Space Museum has provided a taste of total visual immersion by use of a specially designed theater combined with a wide angle projection system. (Having experienced a show there, it comes as no surprise that the realism of the visual simulation has left several people sitting in the theater air sick.) Finally, in Hershey Pennsylvania, a tour of the Hershey Chocolate factory is no longer

possible. Instead, one rides through a simulated display of the entire process of producing chocolate while being exposed to visual, auditory, and olfactory stimuli that do a fair job of simulating reality. When scientists solve the problem of reproducing olfactory, tactile, and kinestetic experiences, it may be possible to "record" experiences--in five senses, such that we can record and provide for our progeny a true time machine experience.

c. Telelecachronacompucommunications is becoming more interactive. Interactive cable systems and home computer systems are familiar examples of interactive TEACC. Science fiction, in the form of the movie Westworld provides a ready example of one manifestation of the ultimate endpoint. However, from aircraft simulators to video game arcades we are being exposed today to ever more sophisticated, and in many cases simpler to use, TEACC devices. There has even been an attempt made to develop a theme park filled not with rides but with TEACC devices. Called "Sesame Place," it had a vast "Computer Gallery."

> The Computer Gallery is an electronic playground, with 70 computers that challenge both youngsters and adults to solve puzzles, play competitive games, form patterns, make words and letters, create musical compositions, and test their hand-eye coordination. The games are grouped in theme clusters: space and gravity, motion, sports, animals and ecology, art and patterns, and creative writing. There is a special cluster for computer buffs who want tougher challenges.[16]

d. Telelecachronacompucommunications is becoming simpler. Not only is the technology cheaper, more comprehensive, and more interactive, but it is simpler to use. I owned a Sony TV for a year before I realized that the reason I got such a perfect picture was not because of my accurate adjustments, but because the "automatic" button completely overrode all my

---

[16]Hanna, S. Let the Cookie Monster Help. Instructional Innovator. November, 1980, pp. 10-11.

inputs. There was a time when pushing "AFT" on a television simply changed the picture--most of the time, not for the better. It is hard to find a computer these days that will not tell you how to use just about any program in which you have an interest--all you need to do is "Type 'H' for help".

2. Educational Developments

e. Higher Education is diversifying. Over the years, higher education has slowly diversified. Historically, this diversification has taken the form of new institutional systems created to fill needs existing institutions felt outside their scope—the state colleges providing agricultural/and technical training, the normal schools providing teacher training, and the community colleges providing open access. With time, most institutions have diversified to the point where they provide opportunities in the career development and professional preparation as well as the liberal arts experience.

Additionally, most institutions have now diversified to the point where they offer a wide variety of options, in terms of access, to students. These include class offerings in the evening, on weekends, and at off-campus locations, as well as by independent study. Further, admissions criteria have become, in many institutions or parts of them, more functional than selective. More and more, institutions are adopting Cy Houle's second credo of adult education.

> ...since men and women know what they need to learn, the task of the educator of adults is to discover what it is and provide it for them.... The educator's methodological task is to devise, perfect, and use the techniques and instruments which reveal the apparent interests and the felt or ascribed needs of the individuals or groups he serves.[17]

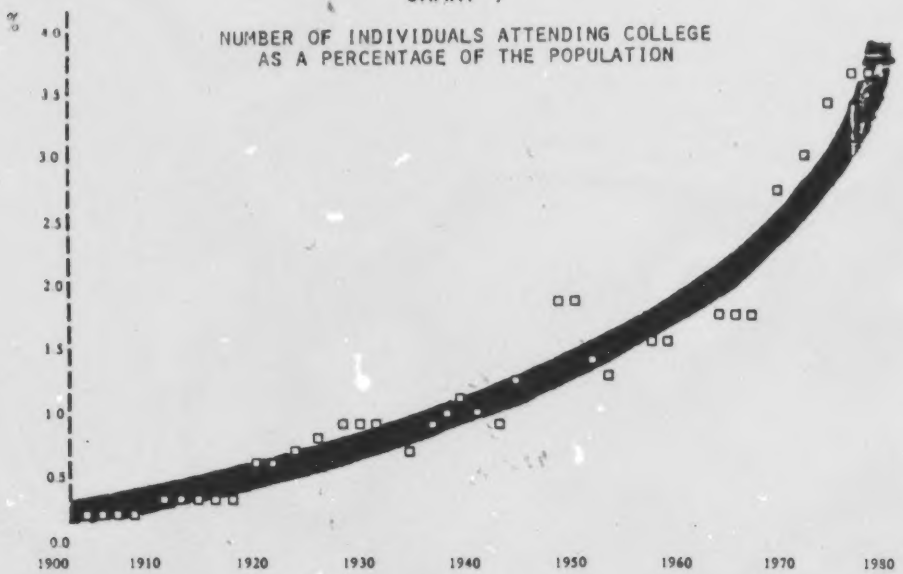
---

[17]Houle, C. The Design of Education. San Francisco: Jossey-Bass, 1972, p. 7.

Adherence to this credo, in part or in whole, enhances the methodological and curricular diversification of institutions. It also contributes to the development of a learning society.

f. Higher education is expanding. Even though Stanley Moses' statistics suggest that higher education is no longer the sole, or even major provider for post-secondary learners, there is clear evidence that more and more people are making use of higher education. As Chart 7 shows, the percentage of the population attending college has grown exponentially over the century.[18] While this curve will level off in the near future, and possibly decline, it provides a clear indication that more people are involved with higher education than ever before. To the extent that these people are learning to learn, they may contribute to the development of the learning society.

CHART 7



[18] Manning, S. Management Strategies for Instructional Growth. Proceedings of the Third National Conference on Open Learning and Non-traditional Study, 1976, p. 136.

3. Children, Telecommunications, and the Learning Society

The final five points to be described have to do with children. Important signs about the potential, or lack of potential, for a learning society may be seen in children. As Milton puts it, "childhood shows the man, as morning shows the day."

g. Television may contribute, or be deleterious, to the intellectual development of our children. John Debes suggests that the emphasis on verbal literacy in our schools may be handicapping a number of children who are visually oriented. He presents evidence to suggest that as many as 33% of our children may be visually oriented.[19] If this is the case, it can be expected that television may, for the first time, provide a technique to use in helping them to develop their skills. Evidence is developing, in part from recent studies on the Stanford-Binet intelligence test, to suggest that television may be having a positive impact on intellectual development. Beginning at the age of about two, the IQ of United States children rises sharply until, at the age of about 3½, the IQ is near 110. It continues to rise slightly until about the age of 5½; then it begins to decline until at about the age of 8½ it reaches 102. At about nine, it begins to rise a little bit but on a very gradual slope upward.

> One of the colleagues of Dr. Thorndyke is doing an item-by-item analysis of the scores of children on the Stanford-Binet tests. He is attempting to ascertain which items of the test are responsible for the rise in IQ. Dr. Thorndyke was kind enough to suggest to me that I might with justice feel that the hypothesis concerning television and visual literacy tends to be confirmed by what is being found. The test items upon which these children excel and which are responsible for increase in IQ are nonverbal or visual items.

---

[19] Debes, J. L. Mind, Languages, and Literacy. Paper delivered at the 1974 Annual Convention of the National Council of Teachers of English. (ERIC Document Reproduction Service, No. ED 108 659.) pp. 4.

> Why should TV cause this tremendous rise in IQ? First, it is visual, and the eye is our most potent communicative organ. Second, what is presented on TV is nearly always intentional communication, that is, it is presented with the idea of communicating something precise or definite. Third, it is sequential or chronological or logical. It is generally, in fact, linear very much as sequences of words are linear. Finally, what is presented on TV is conventionalized; by that I mean that the visual symbology used has meanings that are culture based and a structure that is learned by use, somewhat as words are culture based and are utilized in structure established by use.[20]

While Debes finds evidence to suggest that television may be beneficial to some forms of intellectual development, Singer and Singer are uncovering evidence that television may be destroying our ability to "imagine"—to be creative.

> "Imagery and lexical systems seem essential to the highest levels of thought. . . (and) it is possible . . . that the immediacy of television precludes our more active integration of images and words."[21]

h. Television may destroy diverse, stable, and create stereotypic, role models. Drs. Dorothy and Jerome Singer, of the Yale Family Television Research and Consultation Center suggest that

> "No sane parent would present a child with a fire engine, snatch it away in 30 seconds, replace it with a set of blocks, snatch that away 30 seconds later, replace the blocks with clay, and then replace the clay with a toy car. Yet in effect, a young child receives that kind of experience when he or she watches American television."[22]

Of perhaps more importance than the reduced attention span some researchers attribute to heavy television viewing is the change that is

---

[20] ibid., p. 5.

[21] Singer, D. & Singer, J. Is Human Imagination Going Down the Tube. Chronical of Higher Education, April 23, 1979, p. 56.

[22] Moody, K. The Research on TV: A Disturbing Picture. The New York Times: Education Supplement. Sunday, April 20, 1980, p. 17.

taking place in stable role models for children. In a different era, children encountered adults in their life space who became role models. It might be a parent, teacher, social club leader, local merchant, neighbor, or other adult with whom they had regular contact. Today, most role models for children are television or movie stars. They are for the most part uni-dimensional characters. In many instances they may be snatched from our children (by the ratings) at just the time they become most important. More importantly, unlike real people, television role models do not exhibit a spectrum of human strengths and weaknesses. The supercop does not get flat feet, fall in love, have children, or suffer a mild heart attack. They seldom move from city to city, get laid off, or change jobs. It is these individuals who serve as the role models upon which children base their most appropriate behavioral responses to given situations.

The few "stable" role models that television does develop are not the most desirable. Chulay and Francis found that commercials on Saturday morning television oriented the female child to traditional feminine roles in society as a typical wife and mother concerned about her appearance and accepting the role of a sex object. The concept of woman as being independent and successful in the business world is not shown.[23]

i. Television may be a Skinner box turned inside out. The impact of this all powerful operant conditioning mechanism has been made clear over and over again. Some of the more notable examples of verbal conditioning include: "Live long and prosper" (Star Trek); "nanu, nanu" (Mork and Mindy);

---

[23]Chulay, C. & Francis, S. The Image of the Female Child on Saturday Morning Television Commercials (ERIC Document Reproduction Service, No. ED 095 603.)

"Oh nooo! Mr. Bill!" (Saturday Nite Live); "And away we go!" (Jackie Gleason): and "Here's Johnny" (Johnny Carson). All are relatively recent examples of speech behaviors that have changed as a result of television. Hair styles, clothes, and non-verbal behaviors have also been learned from (trained by) television. Much attention has been devoted to the exposure children receive to violence on television. Drabman and Thomas found that children who had witnessed televised aggression were more tolerant of real life aggression than a control group which had been engaged in other activities prior to witnessing the real life aggression.[24] It should be noted, however, that the Presidential task force, the Scientific Committee on Television and Social Behavior reported that their two year study did not "warrant the conclusion that televised violence has a uniformly adverse effect nor the conclusion that it has an adverse effect on the majority of children." However..."the evidence does indicate that televised violence may lead to increased aggressive behavior in certain subgroups of children."[25]

j. Television is a significant component of our children's day. Given the above mentioned impacts of television, it becomes increasingly important to understand how much television is a part of children's lives. Chart 8 shows the television viewing habits of children ages 2-11.[26] If the time viewing television could be compared to the actual time spent in learning activities during the school day (excluding time on lunch

---

[24]Drabman, R. & Thomas, M. Exposure to Filmed Violence and Children's Tolerance of Real Life Agression. (ERIC Document Reproduction Service No. ED 097 975.)

[25]Technical Report to the Surgeon General's Scientific Advisory Committee on Television and Social Behavior. 1972, GPO#HE20, 2402:T2312

[26]op. cit. Moody, p. 17.

breaks and administrative activities) it would probably come out that children spend more time watching television than they do in school based learning activities. There is a bias today toward condemming this extensive amount of television viewing, but in light of the above points, pro and con, regarding the various impacts of television viewing, it is not clear whether this time is wasted or well spent.

CHART 8

AVERAGE HOURS OF TV VIEWING
BY CHILDREN PER WEEK

		Age Group	
		2-5	6-11
MON.-FRI.	7:00 A.M.-10:00 A.M.	2.85	1.25
	10:00 A.M.- 1:00 P.M.	2.21	.60
	1:00 P.M.- 4:30 P.M.	2.84	1.72
	4:30 P.M.- 7:30 P.M.	5.36	5.07
SAT.	7:00 A.M.- 1:00 P.M.	2.53	2.23
	1:00 P.M.- 4:30 P.M.	.48	.72
	4:30 P.M.- 7:30 P.M.	.69	.73
SUN.	7:00 A.M.- 1:00 P.M.	1.41	.88
	1:00 P.M.- 4:30 P.M.	.34	.58
	4:30 P.M.- 7:30 P.M.	.74	.92
	4:30 P.M.- 7:00 P.M.	.52	.67
MON.-SUN.	7:30 P.M.- 8:00 P.M.	1.41	1.56
	8:00 P.M.-11:00 P.M.	5.44	8.13
	11:00 P.M.-11:30 P.M.	.14	.33
	11:30 P.M.- 1:00 A.M.	.14	.42
	1:00 A.M.- 7:00 A.M.	.21	.34
MON.-SUN. 24-HOUR TOTAL		26.79	25.48

E. A PERSONAL ANALYSIS

There is no book so bad but something valuable may be derived from it.
Pliny the Elder

No book can be so good as to be profitable when negligently read.
Seneca

It is not hard to visualize these contemporaries arguing in the Senate of Rome as to the value of books—and their impact on the children of Rome. Just as Seneca and Pliny the Elder argued about the book, so Plato, using the written word, recorded Socrates' condemnation of the written word as a tool in philosophical discourse.

> This invention of yours will produce forgetfulness in the minds of those who learn it, by causing them to neglect their memory, inasmuch as, from their confidence in writing, they will recollect by the external aid of foreign symbols, and not by the internal use of their own faculties.[27]

This history suggests the first conclusion about the probable relationship between telecommunications and the learning society.

1. Telecommunications will come to play a significant role in the facilitation of learning. Just as the written word replaced oral tradition and the mass printing of written words replaced individual correspondence, so telecommunications will replace the printed word. Telecommunications allows for more complete, intense, and flexible communication than the printed word. In addition, as a medium, it is cheaper and more durable than the printed word. For these reasons, it will slowly become the preferred medium for communicating, especially in situations where the goal is learning. As with books and the written word, the transition will be slow and fraught with arguments—telecommunications will have to go through its "book burning period."

---

[27] Ashby, E. Adapting Universities to a Technological Society. San Francisco: Jossey-Bass, 1974, p. 33.

However, whereas the written and printed word were controversial for centuries, one would suspect that the controversy about TEACC will last only decades.

2. Information, through telecommunications, will become as accessible and affordable as the stick ball and bat. Historically, information and skill development have been hard to come by. For example, training a mechanic to fix a new piece of equipment on a car required that the mechanic travel to a training seminar where an expert could provide instruction. Step by step manuals existed, but comprehensive ones are cumbersome and expensive. Further, seeing was believing. Now, General Motors can provide visual instruction with stop action and slow motion capabilities interspersed with appropriate text in the form of compact video discs. The capability now exists to place the entire contents of the Encyclopedia Britannica on two video discs. The cost of compiling the knowledge remains as high as ever. The cost of pressing the discs and the materials involved has become infinitesimal—less than $5.00/copy for the Encyclopedia Britannica. The major implication of this cost reduction is that every child will be able to keep a significant portion of the Library of Congress in their closet for a little more than it will cost them to keep a pigskin, baseball and bat, and basketball. Put another way, the cost of telecommunicated knowledge and skills will be far less than the cost of the personally and print transmitted knowledge and skills now taking place in classrooms across the nation.

3. Telecommunications will be found to be an effective mechanism for almost all forms of teaching and learning. Learning involves an individual developing knowledge, skills, awarenesses, and attitudes. It is easy to see how a TEACC device as "simple" as a television set allows an

individual to acquire knowledge across a diverse spectrum from historical fact to economic principle to grammatical rule. More sophisticated TEACC devices, such as Control Data Corporation's "plato" system can teach willing learners conservation of mass and volume and the operation and use of the Skinner Box. Aircraft simulators provide a familiar example of how TEACC may be used in complex skill development. Simpler simulators providing training in ever more realistic skills may be found in many of the electronic arcade "games" that are slowly evolving into electronic arcade simulators. Again simple devices such as television provide an opportunity for learners to become aware of their environment and to develop value systems. News and cultural specials, often followed these days on public television by panel discussions provide the fodder for this type of learning. More complicated TEACC devices such as computer simulations of local government operation, business operation, or small group dynamics provide more intense experiences in the impact of value and action decisions which contribute to our awareness of the consequences of our actions and the consistency of our attitudes and values, both internally, and in comparison with societal and sub-group norms.

4. Telecommunications will become the primary teaching device of the learning society. It is apparent that telecommunications can take on the job of providing the massive amounts of instruction required by a learning society. Further, it is clear that telecommunications provides the means for providing these learning opportunities at a cost that will allow the society to continue to engage in the other activities (e.g. health, commerce, and defense) that will insure its continued existence. Using telecommunications to its full extent will require that "teaching" professionals redirect their energy to become "learning experience

developers", "tutorial experts", "guidance professionals", and "assessment professionals". In these roles, freed from the drudgery of having to provide every student with instruction toward every bit of knowledge, development of value system, or proficiency in skills, the professional educator can assist a vastly larger number of people in prescribing learning engagements, diagnosing and correcting learning deficiencies, and assessing learning outcomes. A prototype for such a system is already in existence. It may be found at Beacon College in Washington, D.C. With the assistance of "Program Advisors" and under the general supervision of "Monitors", students prepare curriculum proposals and course proposals that are submitted to an "Academic Council" for approval. Pending approval, students engage in particular learning projects using "Resources". The final results of projects are submitted to "Evaluators" for assessment. The final results of the projects along with the evaluator's assessment are subsequently submitted to the "Academic Council" where, if approved, the student is given academic credit. The "Resources" and "evaluators" of Beacon College are a variety of human and nonhuman resources engaged by the student. (They are not employed by the College.) The institution's responsibility is to guide the student to them (Program Advisors), assess the student's use of them (Program Advisors and Monitors), and to establish appropriate translations into academic programs, credits, grades, and degrees (Academic Council). It is not hard to envision a system where the resources and evaluators engaged by the students are forms of telelecachronacompucommunications. Faculty would be engaged in advising, monitoring, providing corrective instruction and certifying. Most importantly, behind the scenes they would be actively engaged in research to expand the bounds of knowledge and the development of software for the telelecachronacompucommunications network.

EDUCATIONAL TELECOMMUNICATIONS AND INSTITUTIONAL CHANGE

Marlowe Froke*

There's a story that is making its rounds these days in meetings of radio and television people. I guess we're called telecommunications people now--not radio and television--although I recently was asked to review a new book by Addison-Wesley entitled Telecommunications and Productivity in which computers and their sciences were added to the field of telecommunications to form a new word "telematics." It's an appropriate conceptual approach as the other writers, and perhaps I, will be able to suggest.

But back to the story, it's about Socrates. Some of the story tellers shorten it to Sock. And it's about education and continuing higher education and their relatively conservative approach to telecommunications and other phenomena that sometimes seem a bit too pushy.

It was observed in those days that Sock was a pretty good teacher with young people. So one of the early advocates of adult education thought he should be tried out with older folks, too. And Socrates was talked into going outside the city, off-campus, so to speak. And in a natural coliseum, he spoke to a conference on leisure time. I guess it was a conference on wine-tasting. But Socrates had a very soft voice. There were loud calls from the back rows, "Speak up. We can't hear you." So Socrates took a fig leaf, a large one, and curled it and placed it to his mouth and continued his talk. And they heard him, and thus was born the megaphone. And some called it a communications revolution. But some of the educators in the audience weren't quite sure that the people in the back row were learning. So they proposed a study. And there were test groups: Socrates with and without the fig leaf megaphone, teaching young people; Socrates with and

*Marlowe Froke is Director of Media and Learning Resources at The Pennsylvania State University.

without the fig leaf megaphone, teaching older folks. And then there was a control group that didn't get either Socrates or the megaphone. And when the results of the study were reported, there was a certain amount of surprise and disbelief: there were no significant differences.

And so in the 1980s we are back with another revolution. In the intervening years, Thomas Edison forecast one in 1913 when he wrote that "It is possible to teach every branch of human knowledge with the motion picture. Our school system will be changed in ten years."[1] And we've had our other revolutions with radio, television, and computers, with a few skirmishes with programmed texts and other miscellaneous hardware.

My, we are a resistant lot, aren't we.

Even in a more conservative institution, the church, I'm told that attendance in the electronic church today is greater than in the traditional church. That might be something like saying that today more people attend to informal education than to organized education.

Even though I treat lightly the resistance to change by the institution of education in accepting the new technologies and working with them for effective use in instruction, research and public service, I am aware of significant changes that have come to education as a result of a willingness to change.

In a sense, education was responsible for creating what is evolving as a new institution in this country, public broadcasting. Our higher education institutions took the lead in advocating frequency allocations for noncommercial educational radio stations in the late 1920s and early 1930s. And today we have a national public radio network with a majority of the stations operated by institutions of higher education. Higher education also took the lead in establishing noncommercial educational television.

[1]Spring, Michael B. Television in the 1980s: What Continuing Educators Should Know. Continuing Higher Education, Vol. 28, No. 4. pp. 2-8.

And today we have a nationwide system of more than 200 stations, about one-quarter of which are operated by institutions of higher education. The daily broadcasts of the television stations are in the finest tradition of public service by higher education with cultural, public affairs, and instructional programs.

Throughout the country, one can find in almost every institution, exemplary uses of audio and video for instruction and for academic service. The perception that many people have in the communications field that higher education is not effectively using the technologies is probably based on the relatively low level of visibility of literally thousands of uses to which the technologies have been applied. The communications industry, with its heavy emphasis on entertainment, is overwhelmed by what we call hype, for it lives on promotion and visibility, two characteristics that are not a part of the tradition of education and scholarly activities.

And certainly in the application of computer technology, especially in research and academic and administrative services--including the library function--higher education has not been a bystander. We might be frustrated by technologies and our applications of them and concerned about such issues as centralized or decentralized transitions, but we certainly are involved. That our use of them in instruction, public service, and academic and administrative services is far below potential may be no more complicated than the obvious--a lack of adequate financial resources. More likely its cause is that education is one of the human services of society where applications should be restrained and where applications are infinitely more difficult because of attitudes and traditions.

The Chronicle of Higher Education, however, reported in October that Stanford University's president now has a terminal in his office--as do

about 40 of the institution's administrators (later there will be 75)--and they are sitting at their terminals experimenting with a variation on electronic mail for communications rather than hard-to-schedule meetings, letters, or memoranda. And I guess that's important.

More significant is an awareness among faculty and their disciplines of what is happening to communications. The disciplinary journals reflect that awareness with frequent articles.

In fact, the word revolution is used in the Report of the Commission on the Humanities, The Humanities in American Life, published by the University of California Press, Berkeley. "The revolution in telecommunications and data processing is transforming the way knowledge is gathered, stored, and transmitted. New and coupled technologies can help students, teachers, scholars, and adult learners by saving time and offering versatile modes of learning. The new technologies provide libraries and other institutions with indispensable means for preserving and storing materials and for increasing access to them."[1]

If change and assimilation are occurring and if awareness does exist, what is there that is different about this new revolution that deserves your attention.

I think the answer probably rests in scale and in magnitude; a scale and a magnitude that moves the discussion from the incidental applications in individual institutions to applications on an institution-wide basis that challenge some of the nonhuman organizational influences on higher education.

My thesis is that higher education is organized primarily around physical space. Its medium--a reflection of the industrial age--is the

[1]The Report of the Commission on the Humanities. The Humanities in American Life. Berkeley: University of California Press, 1980, p. 14.

brick and mortar of the classroom. In an earlier time when transportation and communications were far more difficult than today, the classroom, of necessity, became our medium of instruction. It was in the classroom that the faculty met with the students. It was there that the faculty developed various roles as mentor, model, lecturer, and agent provocateur. Educational institutions were built around the classroom medium. The financing and quality of education were measured in the number of minutes in a classroom, the number of class meetings, and the number of weeks for the classes for certain units of assumed knowledge. To the classroom buildings were added the library buildings for storage and retrieval of information and knowledge, the dormitories for housing, the cafeterias for food, the student union buildings, and others, for other aspects of the environment of learning. And the medium became tradition. And the institution's faculty and staff, and administrators thought in the context of physical space.

The scale of the new revolution requires a new context for institutional planning and development, a context that I call communications space. The scale and the magnitude of the new revolution requires that institutional planners deal with communications space at a priority level equal to that of physical space.

There are four categories of evidence.

The first is capacity. It is now possible to think realistically about complete curricula and programs to be delivered through telecommunications or telematics rather than occasional and miscellaneous courses and services. It also is possible to think about complete academic and administrative services that are necessary to complement the instruction. The rapid development of cable television technology with its huge capacity for

dissemination to home, business and industry; satellite communications, including the potential of satellite to home dissemination; and fiber optics with its gradual adoption as an alternative and replacement for coaxial cable are all indicators of the resolution of the capacity problem. One of the major influences in the change in federal policy from regulation based on the so-called "scarcity principle" to deregulation and competition is the increase in capacity which makes possible not only an open market but also an open market of ideas. The Federal Communications Commission in December 1980 approved proposals which by 1985 will result in a quadrupling of the capacity of our domestic satellite system.

When in New Orleans for a talk in 1980, I noticed on the table of my room at the hotel the magazine of the city. Its title--not surprisingly--was New Orleans. And one of the stories in it was about the City Council deliberations on a cable television franchise award. The bidders offered capacity ranging from 36 to 120 channels. What would New Orleans do with 120 channels of television? Or 90 in Pittsburgh? Or 100 in Atlanta?

The answer might come from the results of extensive testing now in progress in Columbus, Ohio, where 30 channels of cable television provide conventional entertainment and a linking of computer technology and television for a variety of educational and informational services. The October 6, 1980 issue of Fortune magazine lists, in addition to instruction: a daily video newspaper, electronic mail service, banking, home alarm systems, home energy management, and other services.

The second evidence is access to knowledge and information bases such as those provided by present-day libraries and their storage and retrieval of books and other publications. Through the new dissemination technologies and the storage capacities of computers and video discs, it is technically

possible for individuals to have access from their homes to bibliographic information in the Library of Congress, the Sorbonne, and other major libraries of the world. An RCA Vice President recently forecast that capability in the next decade. And Bell Telephone Laboratory researchers have made similar statements in demonstrations of new prototypes of the telephone of the future. It will combine the present voice instrument with a computer terminal. What are technical jerry-rigs already exist and are in use.

A third is mass production and the lowering of unit costs. Just as the television set moved to a price level that could be afforded by and perceived as a need by every household, so will computer technology. Microprocessors and floppy discs can be bought at local electronics stores. Combined with the television set, video tape or video disc players, audio tape players, and connections to telephone or cable, the home, the office, or the dormitory room become major sites of learning. Miniaturization and other improvements in electronics technology have brought to telecommunications and to education the potential of looking at electronic devices and their products in the same way as one looks at printing equipment and the printed word. One has only to visit an up-to-date newspaper to realize the affinity of the printed word to telecommunications. Computer terminals are in place for reporters to write and edit their stories. The Knight-Ridder Newspaper group is conducting feasibility studies on the delivery of information directly to the home. A number of organizations and agencies, including the New York Times, already have prototype systems in place.

A fourth evidence is ease of operation and reliability. Communications technology now makes possible products and equipment that no longer require the intermediary of technical operators or maintenance personnel, ever present, to tweek them to maximum performance.

Accessibility, low cost, capacity, ease of operation, and relative ease of maintenance of telecommunications devices are all of major significance in education today.

Those characteristics make it possible for the planners of institutions of higher education to think in terms of communications space as well as physical space. They make it possible to think about developing new types of instructional systems--based in the telecommunications technologies--in addition to that which is based in the industrial technologies. The instruction, the academic services, and the administrative services for the system would reflect the advantages and disadvantages of the telecommunications media just as the present instructional system reflects the advantages and disadvantages of the classroom medium.

There are external motivations for existing institutions of higher education to look to telecommunications and to new relationships with other institutions in society. New organizations and new institutions, based largely in telecommunications, already are developing. There is, for instance, Coast Community College, a nonresidential college in California, which is organized around telecommunications. And it appears to be highly successful.

The University of Mid-America, a media-based institution headquartered at Lincoln, Nebraska, is now doing a feasibility study for a national University of America. It, too, would be based in the media.

The American Hospital Association is attempting to organize a satellite-based educational program that would be delivered directly to hospitals nationwide. Cost estimates include installation of a satellite ground station at each hospital to receive the educational programs.

In the informal, noncredit educational field most of your major hotel chains have either ordered or are placing orders for ground stations so that new types of conferences--a creature of energy costs and shortages--can be planned and delivered.

And these are only a few of the examples that could be given.

Major business corporations are also organizing educational facilities in the telecommunications technologies. And some already are moving toward degrees.

According to the Chronicle of Higher Education, business and industry now spend anywhere from $10- to $100-billion a year on postsecondary education and training, reaching anywhere from 12.7- to 16-million workers. The story was based on studies done by the National Institute for Work and Learning, and Dr. Alan Wagner, an assistant professor of consumer sciences and retailing at Purdue University. The figures are dramatic in comparison to the expenditures by colleges and universities in 1979, an estimated $50 billion.

In another educational area, proprietary education, both federal and state policy are looking more favorably toward the proprietaries with the most dramatic policy change occurring only a few years ago when student financial aid restrictions for proprietary institutions were lifted.

Some of the descriptive writing in this country about our total human learning system has used such words as core and periphery, with core being used to characterize the traditional educational institutions that provide organized education. The periphery characterizes those organizations and agencies that provide education, but as a secondary mission to their assumed or assigned role in society.

There are some major issues, here, including the fact that most of the periphery does not have research as a function of its role in education. And as in political systems, a question in education might well be whether the core--the center--can hold.

Our professional educational associations are studying learning in the peripheral situations in both critical and supportive ways. The American Council on Education, following its established pattern of evaluation of military programs for existing institutions, for example, is now evaluating programs from business and industry.

If one wishes to engage in scare tactics, there is enough anecdotal evidence to suggest that some rather major realignments in the institutional structure of education are taking place, and telecommunications is a major motivating force. The question might well be whether existing institutions can adapt, modify, assimilate and change rapidly enough--and at the same time establish and maintain quality standards, which is one of the responsibilities of the core--or whether other institutions and new organizations and agencies will emerge in significant numbers and assume significant responsibilities for organized education in the United States.

Dr. de Sola Pool, a political scientist at Massachusetts Institute of Technology who specializes in telecommunications and its impact on political and social structures, raises the quality question in a slightly different context. Writing in Technology Review, he states a proposition, and then he asks two questions: "Diversity allows wide participation with many outlets for creativity. So we confront a dilemma: How shall we choose between a society in which many mediocre performers compete for the public's attention and one in which only a few superb stars perform? What of the

probability that out of vigorous artistic experimentation and amateur effort may flower products of great value that would otherwise be lost?"[1]

The two questions could raise enough speculation for a lot of conferences.

What then are some of the specific implications of the new telecommunications for faculty and for their administrative and academic support services in our existing institutions? Let me mention some of the most important, those that I have described in earlier talks and articles.

1. New Perspectives on Promotion and Tenure

   Teaching as a criteria for promotion and tenure needs to have broader parameters. The teaching of students through a telecommunications system should be at least equal to that of teaching in a classroom system.

2. New Perspectives on Faculty Workload

   The teaching function in most colleges and universities is measured by workload indicators which are keyed to the classroom. The number of courses, the number of classroom meetings, the number of students in the classroom, the number of laboratory sections--these and other measures--are accommodations to the classroom medium. New types of workload indicators need to be developed for a telecommunications system and the variety of roles that a faculty member might play in it. These include the adaptation and modification of existing materials, the teaching of individual students, and serving as a proctor or a mentor for students who are pursuing independently a course of learning. We really have no measures that are comparable to what has been developed through the years for the classroom medium.

[1]de Sola Pool, Ithiel. Technology and Change in Modern Communications. Technology Review, November-December, 1980. p. 70.

3. New Perspectives on Research and Scholarly Activities

For the most part, our four-year and graduate institutions measure research and scholarly activities by the number of publications, the nature of the publication, and the research methodologies involved. Only a few institutions interpret the term publication to include creative and scholarly activities that are published by film, audio tape, television, computer programming, and a wide variety of other publication forms that are now possible with the new media.

4. New Perspectives on Students

The growing acceptance of the necessity for life-long learning has brought into the classroom an ever increasing number of part-time learners. The new technologies only accentuate the need for new approaches to these students which will reflect the age differences, their maturity, their experience, and the diversity among them.

5. New Perspectives on Preparation for Teaching

The additional stimuli that are available through use of the media as a means of enhancing learning, and perhaps enhancing its effectiveness, require on the part of the faculty an awareness of the media and their limitations. I think we all recognize that some faculty have mastered the classroom medium. If that be the case, one can only lament the problems that lie ahead for faculty who may know their message, but do not know their medium.

6. New Perspectives on Collegiality

The classroom medium has tended to extend academic freedom to include such euphemisms as the teacher being the master in the classroom. It has tended to pair up a classroom with a teacher. We have tended to ignore the breadth of academic subject matter which denies realistic

possibilities of academic competence by any one faculty member, especially in broad introductory courses. The classroom medium has tended to shield this from our view. As we move toward an open-learning system and the greater degree of permanence of its learning materials, such as in the publication of a book, it becomes obvious that most courses will be the result of team teaching or at least a number of faculty consultants, and prepublication reviewers.

7. New Perspectives on Administrative and Academic Support Staff

A good faculty must continue to be the core of a great college or a great university. And it would be expected that with a new instructional system they would continue to be the principal personnel resource. The critical role of administrative and academic support personnel, however, especially the creative artist, film makers, producers, directors, computer programmers, and others, will become more apparent and their status within colleges and universities will be enhanced.

8. New Perspectives on Learning Environments

Just as colleges and universities have focused attention on development of physical space for the classroom system, equal attention must be placed on communications space. Long-term plans for communications need to be put in place so that each telecommunications addition to a university--even a single job with the back hoe to increase the capacity of one line--fits into a total plan. The total plan needs to accommodate dissemination for data and text, voice, and image. It needs to accommodate what you now call residential needs. That becomes the base from which external dissemination can emerge. Telecommunications systems sometimes are perceived as the spanning of distance.

The distances, however, need to be regarded as building to building as well as community to community and nation to nation. Institutions need on their staffs persons that would have the skills and knowledge of what I call a "communications architect."

And why not? In the fall of 1980 I was in Brazil working with Radio-Television Cultura, the educational network based in Sao Paulo, Brazil. After the work there I spent a couple of days in Rio on business with Embrafilme, the central film agency. And between meetings I was on the beach. Reluctantly I had to think about coming home, but I thought about ways of staying. My colleague from the political science department at Penn State had a class so I suggested that we lease time on a satellite and do the class from Rio. We didn't, but we still think it's a good idea. There's a footnote to the story. When I got back home, there was a letter from a faculty member at the Middle East Institute, University of Pennsylvania. He invited comments on an International Education by Satellite project in which foreign language would be taught with a two-cultures approach. Students at a university in another country who are studying English would be connected by satellite with students at a U.S. university who are studying the other country's language. And again, why not?

We might even have to revise our approach to sabbaticals so some faculty could be on permanent sabbatical in another country in order to teach effectively a course that requires foreign resources.

Considering the developments that have taken place and the pace at which education has assimilated them, one can write several scenarios for the next decade. The first is that higher education will do relatively little and that everything will come out all right any way. Such a scenario would be based on a comparison with the publishing industry. It has been

embraced at only a distance by institutions of higher education. Some colleges and universities, feeling that there would be some knowledge that would not be published within the context of a commercial publishing industry, did lead the way for the university press development. Another response was to encourage faculty to do research and studies and creative works and then through the commercial and vanity press systems get the books into the educational markets. Education avoided institutional relationships with the commercial book publishing industry. Instead the relationships were those of individual faculty negotiating directly with commerce. That pattern could easily be the one that emerges in the development and production of telecommunications software. Indeed that has been the pattern in educational films. For the most part they are produced through commercial channels using faculty from educational institutions. The films are then distributed to the educational community for selection and use within a classroom and environment. This scenario presupposes that the educational institutions will be satisfied to relate to the output of the telecommunications industry on a random basis. From an institutional point of view, the educational community would not seek a direct administrative or organizational involvement.

The educational community would be saying that anticipated results, based on the history of the book publishing industry, are adequate to assure a reasonable supply of telecommunications software for the vitality and strength of organized education. The dissemination or distribution function, however, would not be addressed.

A second scenario that would be written is one showing the emergence of new types of institutions that would be organized and developed--with their own faculties--to capitalize on the instructional and educational

systems that are possible with high level telecommunications technology. Such institutions would have characteristics that are different from institutions now in place. The faculty who work in such institutions would have roles different from those they now have. They would be primarily writers, editors, and facilitators for learning rather than the direct conduit for instruction. The lecture format would be nonexistent, and some would mourn its passing. As an art form, and as practiced by still a few today, there is much to be said for it. The lecture, however, is really a form drawn of necessity in the centuries prior to mass printing. Because of a lack of books and other printed material, the individual teacher was the memory bank for the knowledge that existed.

The second scenario also puts the students in new roles. They would be primarily independent learners, looking to themselves as responsible for their own learning, but choosing a particular style of learning that fits their attitudes and abilities. The "learning society," while not a new concept, enjoys wide forums in all discussions of telecommunications.

The new institutions in the second scenario probably would be based in concepts other than geography. There might be national universities, regional universities and colleges. Improvements in transportation and telecommunications make redundant and artificial the geographical boundaries that lock-in institutions of education, our communities, our states, and our regions. Indeed the universities might be international in scope. Foreign studies programs would take on new dimensions. Teaching of foreign language could originate directly from the countries that use it and the teachers could be natives of the countries. We might even have less paranoia about faculty office hours, or lack of them. The faculty could spend more

time working at home without worrying about justification. Telecommunications puts some new perspectives on the women's rights movement, too. Just as women have won their right to move out of the home and into a different work place, the telecommunications specialists tell us that with the new technology most work can be done from the home.

A third scenario might be that colleges and universities would find a capacity to change. The change could occur in an evolutionary way, but the end result would be a university that is diversified in its teaching methods and committed to reaching students of all ages. Emphasis on one teaching medium--the classroom--and one primary student audience--the more youthful audience--would be of the past. I can see an organization of such a college or a university developing at the departmental level where there would be faculty working with what I like to call an open-learning system, as well as faculty working primarily within the classroom system. They would share research interests. They would share public service interests. And they would share instructional interests. But there would be specialization that would accommodate the different learning styles of students and the different media that are available to be used.

Whether we maintain the status quo, create new institutions, or adapt and modify our existing institutions, the quality issue will still be with us. And I suspect that our perspectives on evaluating quality will change only slightly.

Most of the measures that are now used will continue to be with us. There probably will always be value in institutions stating their mission and being evaluated based on the claims that are made. There probably will continue to be value in policy statements by the institutions in which they spell out their beliefs about the students they serve and how they

serve them. The presence of such policy statements is a useful measure of quality for it suggests some thought on the part of the institution in what it does. We will still look for such input indicators as the faculty and their competencies, although we probably will be looking at a variety of new roles that faculty will play. We might even concern ourselves with the number of humanists who are writing computer manuals. We also will look for the administrative and academic services that are available to support the instruction, and we might even put greater emphasis on evaluating the efficiency of the services and the means by which they are provided.

There will be a few new considerations, too. The permanence of the instructional materials--computer programs, audio and video lessons--will be readily available for inspection; the sanctity of the classroom will not have to be violated.

And competency-based learning probably will come into its own. The communications technologies readily permit its adoption. That will resolve some questions of quality, but it will raise others.

And we probably will still have--and need--accrediting agencies, external bodies that occasionally put the fear of God to us all.

NOTES AND REFERENCES

Acknowledgment is made of the assistance of Carl A. Lindsay, Donna S. Queeney, and Wayne Smutz, all of Planning Studies in Continuing Education, The Pennsylvania State University, for their assistance in compiling notes and references.

Andrews, Grover J. Accreditation and Continuing Education. Continuum. Vol. XLIV, No. 3, March 1980.

Burcaw, Susan S. The Legal Constraints on State Regulation of Out-of-State Institutions. Issues in Higher Education, Vol. III, October 1979, pp. 230-237.

Computer Links Stanford Officials in Test of Electronic Mail System. Chronicle of Higher Education, October 6, 1980, p. 5.

Cross, K. Patricia, Valley, John R. and associates. Planning Non-Traditional Programs. Avoiding Cut-Rate Credits and Discount Degrees, by J.B. Lon Hefferlin. San Francisco: Jossey-Bass, 1974.

de Sola Pool, Ithiel. Technology and Change in Modern Communications. Technology Review, November/December 1980, p. 70.

Harris, John. How Do You Know a Good College When You Stumble Over One? Current Issues in Higher Education, 1979, pp. 35-38.

Conceptually, the problem of ensuring quality (whatever that term may mean) should not differ according to the delivery system for the educational program. Further, the quality of educational programs is tied to institutional quality, which is also an elusive concept. The way out, conceptually at least, is to talk about program objectives and outcomes and to devise methods of assessing outcomes. This line of thought leads to the notion of competencies, a concept which can be applied to all levels of adult continuing education: adult basic education, continuing higher education, continuing professional education, and others and to all types of delivery systems. John Harris' paper provides an excellent foundation for this concept.

Lindsay, Carl. Correspondence with author, October 1980. "Until the state-of-the-art with regard to defining and assessing competencies advances from its present rather primitive technical level and the politics of setting standards for competencies is resolved, there is little prospect for marked changes in our current practices."

McCannon, Roger S. "A Comparative Analysis of Participation in Rural and Urban Adult Education Programs." Paper presented at the Sixty-fourth Annual Conference of the National University Extension Association, Philadelphia, April 30, 1979.

McCannon did not talk about program evaluation in this paper, but did briefly mention evaluation of students' performance. He says, "Formal

credit, grades, and evaluation reports will be less meaningful to adults participating in noncredit, self improvement programs. Effective level growth will be as important to measure as cognitive growth."

Meadows, Edward. Why TV Sets Do More in Columbus, Ohio. Fortune, October 6, 1980, pp. 67-73.

Miller, Jerry W., & Mills, Olive, ed. Credentialing Educational Accomplishment. Washington, D.C.: American Council on Education, 1978.

This book grew out of a two-year study by the Commission on Educational Credit of the American Council on Education. One purpose of the book, to increase awareness of the educational and social significance of credentialing, has little direct relevance to the issue you asked me to address. The second purpose, however, that of recommending changes in the credit and credentialing system, does get into quality assessment. Therefore, I'd suggest that this book might be a source of some useful material.

Moss, Mitchell L., ed. Telecommunications and Productivity. Based on the International Conference sponsored by the Center for Science and Technology, Graduate School of Public Administration, New York University, January 29-30, 1980. Reading, Mass.: Addison-Wesley, 1980.

Nickerson, James F. Quality Guidelines for Programs on Military Bases. Continuum, Vol. XLIV, No. 2, December 1979.

"Quality control is a joint enterprise. Each party in the military, civilian, and academic communities has a part to play and responsibilities to discharge." p. 10.

Peterson, Richard E. & associates, ed. Lifelong Learning in America. Implications and Consequences for the Future. San Francisco: Jossey-Bass, 1979, pp. 443-44.

Peterson discusses the fact that quality will be an absolutely essential attribute of lifelong learning programs of the future. He states that, a lifelong learning program can hardly be expected to thrive in the community; to gain the respect of the general public or individual cultural arbiters; to be held in esteem in other academic circles in the region and state; or to attract funds from government, foundations, or other sources."

He also talks about the elusive characteristics of the term "quality." "In the context of adult or lifelong learning," he says, "We think it best to define quality primarily in terms of the satisfaction of the student." He suggests that operationally, quality would be determined by positive comments on evaluation forms.

The matter of accreditation is one to be considered in looking at quality in education, according to Peterson. He feels that a new type

of accrediting agency, staffed by individuals not bound to the traditional rules of postsecondary education, is needed to address nontraditional educational programs.

Peterson concludes his discussion on program quality by stating, "Whether or not there will be external accreditors, it will be essential that leaders of lifelong learning programs constantly attend to the matter of quality. Too many lifelong learning programs have come under attack for alleged fraud....Continued attention to quality, of course, is important to survival of programs in a totally voluntary education and learning system. It is important also for the success of the lifelong learning movement nationwide."

CAEL documents are a good source of information on the assessment of nontraditional learning experiences, including Warren W. Willingham's Principles of Good Practice in Assessing Experiential Learning, published by CAEL in 1977. In it he outlines six basic steps in assessing experiential learning, but these steps could be applied to other types of nontraditional learning as well. They are:

Six Basic Steps in Assessing Experiential Learning--Their Order and Application to Prior and Sponsored Learning

Step	Prior Learning	Sponsored Learning
IDENTIFY	1. Identify college-level learning acquired through life experience	2. Set specific learning objectives that fit the goals and the learning site
ARTICULATE	2. Show how and what parts of that learning are related to the degree objective	1. Decide on general learning goals that are related to the degree objective
DOCUMENT	3. Verify or provide evidence of learning	4. Maintain an integrated record as evidence of learning
MEASURE	4. Determine the extent and character of learning acquired	5. Determine whether learning meets the criterion standard previously set
EVALUATE	5. Decide whether the learning meets an acceptable standard and determine its credit equivalence	3. Determine the appropriate criterion standard required for credit
TRANSCRIBE	6. Record the credit or recognition of learning	6. Record the credit of recognition of learning

Willingham devotes the most of the booklet to describing these assessment steps, and briefly discusses the administration of assessment activities.

Post-Compulsory Education by U. S. Companies May Be a $10-Billion Business. Chronicle of Higher Education, September 22, 1980, p. 7.

The Report of the Commission on the Humanities. The Humanities in American Life. Berkeley: University of California Press, 1980, p. 14.

Ricklefs, Roger. More Executives Take Work-Related Courses to Keep Up, Advance. Wall Street Journal, March 3, 1980, p. 1.

The author cites the proliferation of continuing professional education programs, particularly those offered in-house, and states, "...there are plenty of complaints about courses that waste time or cost too much. Strong demand has made management courses for adults one of the most lucrative areas in higher education, and perhaps inevitably, the boom has encouraged a proliferation of shoddy courses along with the good ones." In concluding his article, however, he says that "...thousands of students consider the extra training worthwhile. Surveying all of its students in a recent year, AMA (American Management Association) found 64% rated their courses or seminars 'excellent,' 31% termed them 'good,' 4% called them 'fair,' and only 1% panned them as 'poor,'"

Snider, John C. A Slightly Different View of "Quality." Continuum, Vol. XLIV, No. 4, July 1980, p. 22.

Snider suggests that the concept of "quality" receives more attention from continuing educators than any other outreach term. He cites faculty indictments of off-campus offerings as "ineffective and poorly conceived" on the one hand, and professional continuing educators' claim that "on-campus learning experiences are no more effective than off-campus experiences" on the other hand. By way of resolution, he suggests that "Evidences in both corners exist that suggest that learning is a lifelong process and that it can take place in many ways--on-campus and off-campus locations; formal and nonformal settings; traditional and nontraditional delivery techniques; etc.

"We as professionals can live with these opposing points of view. The focus of our attention on the question of quality should be redirected toward establishing strong, solid communication linkages with other faculty and administration groups found on campus. These linkages should begin with some rather basic understandings about today's adult student and the adult learning environment." Included in Snider's basic understandings are the facts that adults don't want to pay for poor programs, they have definite reasons for pursuing continuing education, intrinsic motivation is a strong influence of adult participation in education, educational costs are increasing for adults, and increased competition in continuing education programming is weeding out the fly-by-night operations.

Spring, Michael B. Television in the 1980s: What Continuing Educators Should Know. Continuing Higher Education, Vol. 28, No. 4, pp. 2-8.

Spring traces the development of television technology and forecasts new types of educational services and programs that will be offered by higher education through this medium. His review is tempered with the observation that Thomas Edison in 1913 wrote about film: "Books will soon be obsolete in the schools. Scholars will soon be instructed through the eye. It is possible to teach every branch of human knowledge with the motion picture. Our school system will be completely changed in ten years."

Toombs, William; Lindsay, Carl; & Queeney, Donna. Internal paper prepared by Planning Studies in Continuing Education, Penn State, 1979.

"For nearly a thousand years universities have been 'the institutions in which knowledge is activated, that is acquired and transmitted' (Shils 1978). At first they were custodians of knowledge; later application of knowledge. Nevertheless, how knowledge in its several forms can best be related to practice and application, particularly in the professions, is among the great questions that separate the American university system from those of Germany, France, and England (Ben-David 1977). The ideal modern university and its line of communications with the professions was laid out by Wilhelm von Humboldt as he established the University of Berlin (1810). He envisioned the core of the University to be the 'scientific-philosophical disciplines' inhabited by scholar-researchers concerned with primary knowledge. Around the core the professional schools were seen to be arranged like satellites with an orientation to the world practice. In preparation for the profession, students would move through the disciplinary core and into the professional school where the emphasis lay on specialization and clinical or field experience. This design for professional preparation is familiar to Americans because the reforms of American medical education in the 1920s introduced the pattern as the most acceptable means of training all physicians.

"A second part of the historic intended design has not materialized so clearly, a fact that has special significance. The professions were expected to feed back into the university the problems, needs and questions they encountered in the course of practice in the field. In turn the university-based disciplines, by research and education, would treat these issues and transmit the results to practitioners." As Ben David (1977) points out, "The history of universities in the last century revolves around the effort to actualize the ideal type. Failures lay in many directions and only the American university, particularly in its land-grant configuration, 'developed a unity and hierarchy in its professional degrees that has been almost entirely absent from' the English, French, and German systems. What still stands as challenging unfinished business even in America is bringing together the world of continuing professional practice, appropriate academic knowledge, new technology, and the concept of continuing education."

Yenckel, James T. Education: "The Quiet Revolution." The Washington Post, March 17, 1980, p. B5.

In this article about the fact that more and more adults are enrolling in, and thus changing the nature of, higher education the author states that in teaching classes to adults, "From time to time, professors have had to adjust their grading standards because of the high quality of adult student performance." He also quotes Robert Hawkes, Jr., dean of George Mason University's Division of Continuing Education, as saying that adult students are "'aggressive and assertive' in letting educators know the kinds of courses they want. As a result, 'They have forced educators to look more carefully at the education they are providing.'"

CABLE COMMUNICATIONS: SOME CONSIDERATIONS FOR ACADEMIC PLANNERS

Walter Radzyminski*

> The road to survival now leads through the market place. A new "academic revolution" is upon us....Excellence was the theme. Now it is survival. Institutions were trading up; now they are trading down.[1]

A number of problems face higher education today. Energy, inflation, shifting demographics and a changing faculty composition are but a few. Many colleges and universities in both the private and public sector anticipate a fretful period as the century comes to a close. American colleges and universities do not exist within a vacuum of space or time which can insulate them from pressures of a world constantly changing and reordering itself. Institutions of higher learning have seen in the twentieth century a decline in the autonomy they have historically enjoyed. It appears that the pressures on academe will not be relieved and the decline in autonomy may in fact increase during the 1980s and 1990s.

As institutions fight to survive, administrators and leaders unwilling to acquiesce to the problems will have to choose how to face the stormy future. Certainly, stronger recruitment and retention efforts will be considered. Some universities will seek to increase research and development funds. Some institutions will pare programs and services. Some institutions will look toward using telecommunication technology to assist in overcoming the forecasted problems. Cable television is receiving attention as a telecommunication tool that can be useful in the fight against qualitative decline in academia.

---

[1]Carnegie Council on Policy Studies in Higher Education., Three Thousand Futures: The Next Twenty Years for Higher Education. San Francisco: Jossey-Bass, 1980, p. 30.

*Walter Radzyminski is a doctoral student at the University of Pittsburgh.

This paper explores the possible uses of cable television by higher education during the next twenty years. Following a brief overview of cable technology and history, the paper examines basic advantages and disadvantages of cable television for higher education.

Cable Technology and History

Cable television involves the transmission of visual images and sounds as an electromagnetic signal along a sheathed insulated cable to a receiving set that reconverts the signal. For most, cable television is simply a TV service that, for a fee, delivers greater channel reception and improved picture quality. The Federal Communications Commission (FCC) is the governmental agency which regulates the industry nationally. However, local governing authorities award franchise privileges and, as the result of FCC deregulation of cable in 1972, establish the majority of franchise regulations.

Cable, technically known as Community Antenna Television (CATV), started in the hills of Pennsylvania in the late 1940s. It first took root in rural areas; cost and FCC regulation stymied growth in the major urban centers. However, the 1970s saw major changes and advances in the industry as the FCC changed its cable policies and began to deregulate. With fewer FCC constraints, opportunities were created to move cable into profitable major television markets. These new opportunities led to major investments in the industry attracting large, well-financed firms like General Electric, American Express, Westinghouse, and Time, Inc.

Currently many major metropolitan political leaders are jumping on the cable bandwagon and awarding franchises for their cities. In 1980 alone the cities of Cincinnati, Dallas, and Pittsburgh awarded cable franchises. Construction began in Houston. Boston, Chicago, Philadelphia

and Washington, D.C., had initiated franchise proceedings. With the wiring of major cities and their suburbs will come a tremendous increase in opportunities for higher education.

Opportunities and Advantages Offered by Cable Television

Cable television is able to offer higher education the opportunity to tap new markets, use its resources more efficiently, develop new academic programs, and benefit from noninstructional services. Each is discussed below.

1. Cable television provides the opportunity to tap new student markets. For example, cable can be used to provide staff development. Businesses, small and large, can now offer substantial staff development programs without the expense of employee transportation, work loss due to travel release time, or private consultant fees. Institutions cultivating these kinds of relationships will have opportunities to explore new and often rich clientele groups.

In addition to collaborative efforts with businesses, colleges and universities will be able to work with professional associations. Professional associations concerned with the continuing development of their members are trying to arrange for the education needed. Law, medicine, engineering, and nursing, to name a few, have arranged for some form of telecommunication technology to provide continuing education. Institutions of higher education can provide these services via cable in the local area the institution serves or, using satellite links, reach large segments of professional association membership nationally.

A third group which may see cable technologies as a door to higher education is industry. Tremendous changes are taking place in industrial production. As a result, union contracts are increasingly concerned with

job security, training, and retraining as part of contract packages. Two-way interactive cable communication systems can narrowcast instruction from the campus to the factory. Workers who might have felt awkward in a campus classroom can attend class with factory peers in the nonthreatening atmosphere of their workplace or union hall.

A fourth area, and one that has already received much attention, is the adult education market. Senior citizens, the handicapped, and homebound women are enrolling in higher education. Using cable television to alleviate some of the serious hurdles these groups face (time, babysitting, travel), higher education should benefit from even greater enrollment.

2. Cable television can allow higher education to make more efficient use of its resources. Through the 1980s and 1990s maximizing resources will be an important goal for higher education. Television offers an unparalleled economy of scale for large audiences. As cable firms wire major metropolitan areas, and as cable networks are created, audiences will become accessible to colleges and universities. The greater the audience size, the lower the programming costs per student will be. Many audience appealing lower level introductory classes taped and cablecast can be repeated with minimal or no changes for several years allowing faculty to conduct other scholarly activities while holding down the cost of instruction. This freedom for the faculty could be used for research, public service, counseling, and publishing.

In relation to physical resources, classroom space is conserved and the associated energy costs for that space. Custodial services need not be expanded. Additionally, the institution gains greater flexibility in the use of their facilities. Cable students place minimal demands on the physical plant.

3. Institutions may develop new academic programs to meet the personnel needs of a diversifying cable industry and an information society. As the cable industry becomes a major employer, it will impact upon society in numerous ways. Certainly, new kinds of professionals will be needed. Business schools will need to create courses that teach effective telecommunication marketing. Education's faculty will need to prepare neophyte educators for teleteaching. The health fields can become involved with telemedicine and health care. Social scientists will be needed to study the effects and ramifications of this communications revolution on society. Telecommunication lawyers will be needed to service government, business, and so on. Involving faculty with cable and thus extending their frontier would be a wise policy move which can pay rich dividends in faculty productivity.

4. Cable television has to offer higher education many benefits that are not directly related to instruction. The Higher Education Utilization Study listed counseling, promotion, staff development, community outreach, and forums as services already in practice by institutions of higher learning.[1] This list of uses, all of which are applicable to cable television, can be expanded by adding videoconferencing, security, and recruitment as noninstructional services. With more experience, higher education is likely to develop additional services and derive additional benefits from cable communications.

For those institutions supporting collegiate athletics, cable has a bonus dividend to offer. Cablecasting collegiate athletics can be very appealing. The Entertainment and Sports Programming Network (ESPN) has

[1]Higher Education Utilization Study. Washington, D.C.: Corporation for Public Broadcasting and National Center for Educational Statistics, 1979.

an agreement with the NCCA for the right to televise via cable approximately 350 sports events per year. The University of Michigan has received $75,000 for cable TV appearances.[1] Minor sports that were not profit makers will not offset the economic crunch expected in higher education, but these cable revenues have a rather attractive appeal and help to pay bills.

Finally, cable can be a great public relations tool. Promotion of an institution's image and interests is not to be overlooked. It is quite possible to cultivate public interest and support for the institution.

An Assessment of the Obstacles and Disadvantages

Many advocates of cable communication, in their enthusiasm for the medium, would have the world believe that a panacea has arrived. We have seen significant advantages to cable; there is little doubt that cable has glitter, but is it really gold? In the following section some of the obstacles and disadvantages of cable television for higher education are examined.

Faculty resistance has been a major obstacle to television utilization efforts. A few of the professoriate fear technology will replace them. Some resist television because they feel displaced under bright studio lights and before a camera; the professor feels lost, not in charge of his or her course. Many faculty members complain that television does not allow for the personal exchange of ideas with students. In brief, faculty acceptance of television has been far from enthusiastic and to expect a significant attitude change toward cable would be unrealistic.

A second disadvantage of cable television for higher education is the lack of expertise in the medium. Educational cable television will

[1]Middleton, L. The Cable Connection. The Chronicle of Higher Education, Vol. 19, No. 14, December 3, 1979.

be compared, sometimes consciously, with other television programs. This places a pressure on educational cable television to use TV presentation techniques (close-ups, inserts, superimpositions, etc.) that make the program sound both academically and professionally. The history of educational television, however, is inundated with talking faces--TV lectures.

A third disadvantage of cable is the risk involved. As a university or college commits resources to finance programming efforts, it might find that an audience does not exist. Penetration by cable is approximately 23% of the 76.3 million television homes nationally.[1] If over-the-air reception is good in a given geographic area, then the cable system's penetration may be substantially lower. Cable firms may not interconnect further segmenting potential audiences. The expense of education on top of basic subscription rates and additional services, like a home security and movie channel, may drive potential clientele out of the market. Additionally, customer satisfaction affects higher education's clientele pool. Consumers, unhappy with the cable firm, may terminate service cutting out the institutions of higher learning in the process.

The risk factor extends beyond the cable firms and their penetration rates in a community. The home education market is subject to high attrition rates and uncertain support expenses. A wide range of completion rates are reported for off-campus learners but even the most optimistic rates hover around 50%. Cable television utilization patterns for institutions vary significantly making cost generalization between institutions extremely difficult. Many institutions simply will not know what cable will cost them until they are well into utilization of the medium.

[1]National Cable Television Association, Research Department, February 1981.

The telecommunication field is changing rapidly. While cable TV appears to be the preeminent technology, it is not assured of any dominant position in the future. Video discs, recorders, and responders are now gaining popularity and can dramatically alter the education market. Courses can be produced for these services and distributed through mail services and bookstores virtually eliminating the need for cable. Direct beaming of satellite signals to home satellite dishes would also render cable unnecessary. Colleges and universities may find that they have wasted valuable resources on a fool's gold technology.

Conclusion

So what position should higher education take in response to cable opportunities that are beginning to materialize? Unfortunately, there is no easy guaranteed formula to follow in coming to a decision. Therefore, each institution must seriously consider its unique situation in order to decide if cable TV is gold or glitter. The variable significant to a large research university may have little or no bearing on a small liberal arts school.

The following are some questions that may be considered in the process of forming an institutional response. Does demographic information indicate a need to become involved with cable's capability to reach a specific social, governmental or business community? Is there a need to expand the institution electronically rather than physically, or is the physical plant operating at a satisfactory capacity? Is the institution receiving satisfactory returns from faculty pursuits, or is stagnation settling in? Is becoming involved in a telecommunications endeavor consistent with the stated mission and purpose? Can the institution afford the expenditure necessary for a cable TV effort? Is the local cable company sympathetic

to educational needs and agreeable to working out opportunities? What expertise does the institution already have? Will involvement with cable require incremental change or radical departures from policies and procedures? What alternatives are there for the maintenance of quality, or even in some situations, survival?

Assistance in decision making can be found in many places. Look within the institution to the faculty, the board of trustees, and to the local community at large for wisdom and expertise. Consult with institutions involved with cable communications already. Talk with agencies at the local, state, and federal levels. Discuss with cable operators the institution's ideas. Even better, if possible, have institutional representation in the francising process.

While many advantages and disadvantages exist, it seems that the advantages outweigh the disadvantages. The disadvantages are not insurmountable. Expertise will be gained. Cable penetration will soar in the 80s. The cable industry's performance record will rise. Equipment is becoming less threatening and simpler to use. The FCC, commissioned to assure an orderly national communication system, will probably continue on its logical course of action and not inject havoc with new technologies. Within the industry, technological improvements are occurring. Interactive systems like QUBE have drawn praise and should become standard in modern systems. Channel capacity is now exceeding 100 channels leaving plenty of access space for education. Finally, students of today, being very experienced technologically, expect to interact with contemporary technology in the pursuit of their studies.

The key to any institution's response will lie in its willingness to accommodate change. Some entrepreneurship will be required. Some risk

taking is inescapable. However, in light of the problems and pressures facing American higher education in the near future, academic leaders need to ask, can my institution afford to ignore this frontier and its opportunities?

EDUCATIONAL PROGRAMMING ON CABLE: MAKING IT HAPPEN

Gerry Jordan*

As multichannel cable systems become more commonplace and educators begin addressing the issues and opportunities involved in programming high capacity systems they need to determine how to make the best use of what cable offers. This article's primary purpose is to give educators a way of talking to cable operators about the potentials of educational programming on cable. It also explains why educational programming should be provided, how it should be done, and what it should look like in terms that are important to a cable operator.

The first consideration is why should a cable operator provide educational programming at all? Cable operators already know that potential subscribers are mainly interested in more commercial television, movies, and sports. However, after that, viewers are interested in a variety of programming choices. Education can make a significant contribution to that diversity. As channel capacity increases, and smaller audiences become more important, the value of educational programming will increase.

Education has been regularly cited in surveys by a small, but not inconsequential, number of subscribers as the primary reason for subscribing to or keeping the cable service. Research also shows that a significant number of people watch television only rarely, and that roughly two-thirds of the viewer hours logged each week for commercial television are watched by approximately one-third of the population. Clearly, there are a lot of potential viewers who are not satisfied by current television fare. As

*Gerry Jordan is National Director of Educational Programming for Warner Amex.

subscribers are provided with program options that meet their specific needs, special interest programming gains importance. For those systems currently being built, or being upgraded, or expanded to at least a 24-channel system, promoting subscriber satisfaction and retention is important for ultimately they become a source of additional revenue. Thus, educational programming should be of interest to the cable operator because it contributes to his business.

Mobilization of an educational community to help provide meaningful educational programming can best be accomplished by an intensive ascertainment process. To determine the educational needs of the community, educators must begin with the educational community, not with the programming. Ascertainment is an integral part of the franchising effort and it should be an ongoing process as well. Needs change, as do available programming services.

The first step should be to identify the institutions in the community that serve the educational needs of that community. The list should include preschool centers, public, private and parochial schools (grades K through 12), institutions of higher education, adult education centers, and other informal and formal providers of education. The list should be put in order on the basis of the organization's programming activity, the size of the student body it serves, its uniqueness, the level of interest and commitment to cable, and, finally, the political importance of the constituency it serves. There is no reason for educators to ignore the importance of the political process.

Educators should contact the cable system manager for a meeting and request that the director of programming be present. Educators need to ask what the company's plans are in general, and about educational programming specifically. Educators must be prepared to acquaint the cable operator with the educational needs of the community. They may need to conduct ascertainment

surveys of their own. Educators should lobby for their needs in terms that are meaningful to the cable operator. By being cooperative, prepared, and knowledgeable about the cable business, educators will find cable operators receptive.

Early in the ascertainment process, it may be appropriate to have a formal workshop kick off the dialogue. Until the cable operators and educators are able to understand each other's needs, communication will not be meaningful. Follow-up meetings with the operators will be necessary.

In sum, ascertainment involves presentations, follow-up meetings, surveys, getting something on paper to negotiate, writing the needs into the RFP, and into the proposal. This process should ensure programming that will meet the needs of the community.

In making decisions about the viability of educational programming, it must be remembered that the educational offerings are one part of the larger programming service. They must demonstrate a cost effective return. Educators need to be sure that what they are asking for will result in good programming for the community, and that is also economically feasible for the cable operator. It should be remembered that the person who pays for educational programming in the end is the subscriber. Why ask for 13 channels for educational access when the educational community does not have that much programming available?

Educators whose communities are served by larger systems ought to position the provision of educational programming to cable operators as a way to improve their businesses. Simultaneously, the educational community should look to cable as a way to reach beyond its present boundaries to better serve its students and the community in general.

Educational programming does make an important contribution to the total cable service in a large channel capacity system. Where there are larger

systems attempting to serve special audience interests, education fills an important need. Educational programming, research tells us, makes a significant contribution to the variety and specific kinds of programming people say they want from their service. At Warner Amex, we have offered a good deal of educational programming through the years and have seen firsthand the important contribution it makes to the success of a cable system.

(An expanded version of Dr. Jordan's response appears in the June 1, 1981 issue of TVC.)

YES VIRGINIA, THERE IS A TELELECACHRONACOMPUCOMMUNICATIONS REVOLUTION TAKING PLACE

Herman Niebuhr, Jr.*

Yes Virginia, there is a telelecachronacompucommunications (TEACC) revolution taking place in the United States. It will definitely dominate the human learning system in the future, if it does not already do so. Also Virginia, higher education ought to take note of the revolution and adjust the implementation of its missions accordingly. I would like to suggest that the TEACC revolution is taking place within the context of a larger, even more profound, revolution with even more profound implications for higher education. My conclusion will be pessimistic since I doubt that we have the capacity to adapt.

As Spring suggests, the American system of human learning is moving through changes triggered by the telecommunications inventions. But if we understand the human learning system to include family, community, church, school, college, peer group, workplace and other life settings as well as telecommunications, the changes we are living through turn out to be epochal. The decline in the authority and effectiveness of the traditional agencies of life "instruction" coupled with the rise of the newer "instructional" agencies, such as telecommunications, have put the system into disarray. This state of affairs is little understood by the mainstream institutions who carry on obsolete modes of education, or the media who do not understand their "instructional" impact at all. Yet, there is a need for personal and communal coherence to which the cults, the self-help literature and now the conservative politics are a response. Unless we relate the mainstream institutions to

*Herman Niebuhr, Jr. is the planning officer at Temple University and chairman of the Long-Range Planning Committee for the Pennsylvania Public Television Network Commission.

meet these emerging needs of the citizenry, they are apt to wither and decline more than they already have.

The crisis confronting higher education is focusing on the demographic and economic challenges, but the larger challenges of competition from the profit-sector including telecommunications, and responsivity to emerging needs is far more serious in my view. The very fragility of our domain is illustrated by the Michigan situation: one dip in the necessary revenues and there is chaos. Imagine the chaos should there be a sudden decline in student enrollment brought about by a shift in federal student aid support. Clearly, a capacity to adapt to changing needs and circumstances at the level of the institution and at the level of the total domain needs to be developed and ought to have the highest priority.

Nowhere is this capacity to adapt more urgently required than in the area of telecommunications. If higher education continues to evade the telecommunications age, the computer and communications companies will deliver educational services directly, as they are all planning to do. Moreover, government will applaud their efforts and gratefully grant them the authority to award credentials and degrees.

For the moment the outcome is still in doubt. Despite my pessimism we still have a few years to get our act together before the door slams shut. Let me conclude my comments with a few necessary actions:

1. At local and regional levels, higher education institutions need to work together with other public service institutions to insure an adequate number of dedicated channels on the cable systems for delivery of all kinds of public services, including education.
2. At local and regional levels, higher education institutions need to develop a new kind of partnership with public television and

radio to forge common human and community development agendas. Public broadcasting is currently in a serious crisis of its own and may be open to such discussions.

3. At the national level, higher education needs to invent new organizational mechanisms to give the necessary leadership to adapting higher education to the telecommunications age. This will include managing software development and distribution. Although higher education survived the commercialization of printing by having professors write textbooks for use in classes, the analogy breaks down in a telecommunications age. No one professor, no one institution, or even a local group of institutions can produce and distribute telecourses or computer programs by themselves. The frontend investment, the production values required, and the need to distribute the products widely in order to recoup the investment clearly requires a national effort.
4. Above all, higher education needs to see its own activities, not only in terms of the telecommunications revolution, but in terms of the adjustments required to restore coherence to the American human learning system. Unless we face this challenge, we will be a third-rate domain by the end of the decade.

A year ago I heard a futurist speak eloquently to America's future as a learning society. Clearly, we have become a knowledge and information based society. The new technologies promise new modes of information delivery through interactive connections that will transform the home of the future. He concluded by saying what a shame it was that the nation's colleges and universities will not be a part of that future. There is still time to reverse that prediction, but not much.

PERSPECTIVES

Lorita S. Langdon*

I strongly agree with the philosophy of all three authors, Marlowe Froke, Walter Radzyminski, and Michael B. Spring. Anyone who doubts that a teaching-by-technology revolution in education is coming, needs only to pick up any newspaper or magazine and read about uses of technology in business, industry and yes, in education.

In the Sunday, April 18, 1981, Columbus Dispatch, section F, page 8, three-fourths of a page was devoted to an article about third graders in Apply Valley, Minnesota, who are learning computer technology as the "fourth basic skill." Already these nine-year olds can program a desktop computer and make it perform basic tasks. What if colleges fail to continue what the schools have begun? Won't these students demand to continue to use technology in college? We at Columbus Technical Institute (CTI), Columbus, Ohio, think they will and that they have a right to alternatives to the classroom.

For many years the mathematics department has used a computer program based at Battelle Memorial Institute to teach computer math. A self-teach computer is available in our educational resource center for health students to study anatomy and physiology, and an introductory course in medical terminology employs audio cassettes with programmed materials rather than classroom instruction. More recently, 1978, we began to experiment with telecourses at first in conjunction with Warner Amex's Qube, then with other cable companies and on campus.

We have found that offering telecourses on cable has been an advantage to us in two ways: (1) Cable has allowed us to reach students who would not

*Lorita Langdon is Chairperson of the Communication Skills Department at Columbus Technical Institute in Columbus, Ohio.

(adults afraid to return to the traditional classroom) or could not (family obligations or handicaps) come to the campus, and (2) Cable has helped us become visible throughout the cable coverage area. A real breakthrough for CTI came in December 1980 when Columbus City Council "forced" the four cable companies in the area to interconnect on at least one channel for broadcasting city council meetings. In the fall of 1981, two additional channels should be available on interconnect, one for public access programming and one for educational programming reaching an audience of 50,000 homes. If for no other reason than public relations, cable has helped CTI.

But how do students and faculty feel about telecourses? CTI has found many advantages, both for students and instructors. Since we serve primarily an adult population who has family and work obligations in addition to attending college, the telecourses allow students to attend "class" at their convenience, not at the convenience of an instructor or the college. Amazingly, the attrition rate for the telecourses is much lower than for classroom courses. Perhaps the flexibility is important in this area. But more important, the students have told us that they like the ability to "attend class" several times if they so desire. Unlike in the classroom where the instructor says something once, the students can roll back the tape or watch the session again on cable and attend the "class" three or four times. And for students who have difficulty taking notes, this is a definite advantage. Also, the student can get individual help if he/she needs it. Another advantage for students is the way they study for tests. Instead of sitting down with notes and textbook, the students sit down with a video tape recorder and use the audio/visual to study.

For instructors, telecourses free time for doing research, for writing, for updating tapes, for preparing materials for use with the telecourses,

for holding individual conferences with students, for preparing more meaningful exams, and for grading papers. Telecourses allow instructors so much flexibility because they are not tied to a rigid schedule for classes, and preparation time is virtually cut in half. Obviously, the way instructors spend their time has changed. So how do instructors earn credit for teaching and consideration for tenure? For every thirty students or fraction thereof who enroll in a telecourse, the instructor is given credit for teaching hours; teaching is not just within the four walls of a classroom.

The real key to using telecourses, microprocessors, computers, etc. for teaching is to provide options for students--options that fit their needs. As more and more part-time students attend college, utilizing technology to meet their needs becomes more and more important.

I believe that any educational institution that does not move in the directions of using what Michael B. Spring calls "telelecachronacompucommunications" to disseminate information and to teach students will one day find itself alone with few students.

THEY'RE READY...ARE WE?

Randall G. Bretz*

Andy, 12, is an average sixth grade student. In school he takes the normal courses--math, English, social studies, computer programming. Computer programming? That's right, and it is as much a part of his world as textbooks and the classes which use television to supplement instruction.

At home Andy plays with electronic games which are simplified computer toys. He and his friends challenge each other to the television games which contain computer components. At night Andy watches television programs beamed to his local station via satellite. Some of his favorite TV movies appear on a station which is thousands of miles away, but reach him through cable television and satellite. In six years Andy will be ready for college. Will college be ready for him?

Or is college ready for Joyce, who is there now? An executive with a large company which has offices across the country, Joyce daily exchanges data and written correspondence with her company's multiple offices. A national satellite network connects them. Joyce's average work week often includes a telephone teleconference with managers in other company offices. Two or three times a year she participates in television teleconferences via the same satellite system her company uses to exchange written and audio information.

At nights and on weekends, Joyce watches programs earlier recorded on her home videocassette machine. She keeps some videocassettes for future use; others she watches, then erases. Every Tuesday night Joyce attends a nearby university where she works on her Master of Business Administration.

---

*Randall G. Bretz is Director of Mediated Instruction for the Division of Continuing Studies at the University of Nebraska-Lincoln.

Her professor uses a chalk board and an overhead projector. Written handouts are done in the familiar purple ditto. Joyce could teach her professor a thing or two.

So could Jim, the electrical engineer whose company designs parts for space age communications equipment. Jim built a home microcomputer he uses for play, to manage his finances, and to do problems for work. Like Joyce, Jim uses a videocassette machine to record programs from broadcasts he wants to watch later.

Several weekends ago, Jim drove 75 miles to a nearby college campus to participate in a traditional three-day seminar. His videotape machine and computer could have provided the seminar's information had the university made it available in that format.

Andy, Joyce, and Jim are part of the Carnegie Commission's fourth revolution which is passing higher education by. The higher education community expects these three, and all those like them, to settle for methods of instruction which haven't changed much in hundreds of years. In most institutions, the Jims and Joyces must return to the traditional classroom to obtain the necessary credits and credentials higher education controls. It is no wonder higher education is losing its corner of the continuing education market.

To catch up with the fourth revolution and serve the Jims, Joyces, and future Andys, higher education must make a commitment to and develop a curriculum approach for telecommunications. The commitment must come in financial support for telecommunications facilities in the same way that the campus facilities are financed and supported. Each year campuses across the country pour thousands of dollars into classroom and building renovations, but little is spent to offer students courses they need at times and places convenient to them. In the expansion years of the 1960s and 1970s, millions

were spent to construct classrooms and residence halls for the influx of students. Will the outreach era of the 1980s and 1990s find the same amount spent to reach students in their homes or at work?

In addition to a commitment to physical resources, institutions should make a commitment to coordinate and use existing and new telecommunications resources. Just as when individual courses are combined to form an academic curriculum, each telecommunication medium makes up but a small portion of the telecommunications curriculum. The curriculum approach to telecommunications is a balanced use of each medium to do the job it does best, then combining the various media to provide maximum benefit, effect, and service.

At the University of Nebraska-Lincoln, for example, there is an Instructional Media Center, a Computer Network, a Closed-Circuit Television Department, the Nebraska ETV Network, a Telecommunications (telephone) Department, and a campus radio station, all of which are separate. However, each unit strives to work closely with the others, making it possible to approach the ideal telecachronacompucommunications (TEACC) called for by Spring in his article. Nebraska has made the initial commitment by providing the necessary working tools. As Froke suggested, UNL is finding a capacity to change. If higher education is going to be ready for the Andys, and provide service now for the Jims and Joyces, a commitment must be made, and telecommunications must work together to form a cohesive group, the core curriculum of telecommunications.

THE RELATIONSHIP OF ACADEME TO CITY CABLE TV

Joseph G. K. Miller*

Years ago the key words were educational television and educational radio. Everywhere today we are reminded that we have changed to listener supported fine arts radio and public television. This small change of names must mean that an assessment has been made about the visionary prophecies of a decade or two ago. Indeed yes, there has been. Before anyone asks about the prospects for education via cable television, he or she should ask about the success of broadcast educational radio or television and the educational effectiveness of "Sunrise Semester" or a course broadcast over a public broadcasting station.

In Pittsburgh, the log book on twenty years of radio and television experience would not suggest that new channels would be required to deliver educational services to unserved areas. WQED, the first community owned educational station in America, had a reason or reasons to drop education from its name. In fact, the experience in Pittsburgh regarding electronic or journalistic means to reach underserved scholars has been underwhelming. Interestingly enough, most of the enrollments in Courses by Newspapers were by full-time coeds at Pittsburgh's Carlow College--the sponsoring institution. Similar results were observed by other institutional sponsors of courses carried on radio and television. Only six out of a potential two million viewers signed up for an early morning university television course on the most powerful station in the region.

When Warner Cable Communications arrived in Pittsburgh with multiple channels and many franchise promises about access, the members of the

*Joseph G. K. Miller has recently retired from the position of Executive Director of the Pittsburgh Council on Higher Education.

Pittsburgh Council on Higher Education (PCHE) felt that they should open linkages with one another and possibly generate some collective views on the educational uses of this new technology. Representatives of PCHE served on advisory bodies for years before Warner arrived. For upwards of another year a dedicated PCHE committee, chaired by Dean James Evanko of the Community College of Allegheny County, grappled with major aspects of relations and interrelations among schools in sponsoring, renting, buying or producing television courses for use in public affairs programming and credit cable telecourses.

Many of the details are yet to be worked out. The local community college is bravely offering three courses via WQED-TV, but has yet to be oversubscribed. Many on the television committee are convinced that colleges in cooperation will be a significant aspect in the expectations for great growth of the educational dimension of access to cable television, at least in the immediate future.

Other communicators believe that the versatility and abundance of cable television channels will provide an attractive forum for political, fine arts, sporting, cultural, graduate and special education programming. Many of these programs could originate from college and university campuses, either live or on tape. The evidence is not completely convincing that the options are viable. Fragmentation with telecommunications has its own problems and small audiences have peculiarities all their own.

A potential major advance is that viewers will have more choices and, if they choose, can use cable television selection to view much more "education." On the contrary, just as the "Grade B" movie reruns attract few viewers to the entertainment channel, educators have to expect that performances of less impact than The Ascent of Man or the Adams Chronicles

will be attracting smaller audiences. Overall, however, there should be an increase in the total audience viewing the educational smorgasbord of offerings.

The PCHE committee concluded that many students who subscribe to television courses would be led by their educational experience to migrate from the living room to the classroom. The evidence seems to support this conclusion in a limited fashion.

REFLECTIONS ON TELECOMMUNICATIONS, FEDERAL INITIATIVES, AND ACADEMIC RESPONSES TO TECHNOLOGY

Susan Fratkin*

As Director of Special Programs for the National Association of State Universities and Land Grant Colleges, in Washington, D.C., my perspective is quite different from that of the other respondents located at institutions or dealing directly, on a day to day basis, with the technologies discussed. My primary role is to reflect on legislation, regulation, and the probable response of the academic community to new developments in technology.

I am very committed to furthering the integration of technology on our college campuses, going beyond the now historical efforts in continuing education and university extension. It is my belief, based upon working with the Association's Educational Telecommunications Committee for the last seven years, that there is a vast role for technology within the academic framework. Television, in particular, is not a substitute for faculty, but can clearly augment and amplify coursework that is already being taught.

At this juncture, the consuming concern in Washington is the implications for higher education of the new administration's budget. Clearly, the approach to higher education, the support of students, and support for the development of technology are all greatly dependent on monies that are forthcoming from the federal government. While Mike Spring does an excellent job of examining the implications of telecommunications developments on a learning society, it is important to recognize that some of the implications are currently tied to a new thrust emanating from Washington. For example, major deregulatory efforts on the part of the Federal Communications Commission will have an overwhelming impact on radio and television. Legislation introduced by

*Susan Fratkin is Director, Office of Special Programs for the National Association of State Universities and Land Grant Colleges.

Congress this session will also have great impact. Senator Goldwater and Congressmen Collins and Wirth are very much concerned with restructuring and refocusing the Corporation for Public Broadcasting. The Corporation has had a significant impact upon the type of programming that has been developed, although perhaps not as much in education as in entertainment. Nonetheless, some significant programs have been developed under the Corporation's auspices, "The Ascent of Man, The Shakespeare Series, Cosmos" and others. While CPB has never focused as directly on the postsecondary community, it has heavily invested in elementary and secondary programs, the most recent being the programming co-funded by the National Science Foundation, and the development of a significant science program for junior high school students.

Mike refers to the role of the Carnegie Commission, and I must admit at this juncture the Carnegie Commission's report was given scant notice here in Washington, except for a few of the recommendations that related to the role of the Corporation for Public Broadcasting. The focus and fight here has been concentrated on the revision of the Corporation's role and the Congress's efforts at rescission. The whole notion of rescission of forward funded programs, established in order to specifically insulate programs or agencies from political influence, will in all likelihood continue to be a very real problem. At this time, it appears that the Corporation has lost, and not only has its future funding been cut, but its current budget has been cut significantly as well. Furthermore, as a result of recommendations to abolish the Corporation, the Congress has perhaps more wisely chosen to develop line item funding and specify very clearly how much the Corporation is to receive directly from the budget, and how much is to be distributed to the Public Broadcasting System and National Public Radio. These are some of the things that will have a long range impact on telecommunications developments. If, in fact, the Corporation does not put money into educational programming,

if the Public Broadcasting System in its adult learning program has only the courseware developed by two-year institutions to offer, and if National Public Radio takes such large cuts that its nationwide coursework must be either eliminated or drastically reduced, these events will have a direct impact on telecommunications and the learning society.

Yet another element that must be examined in light of the burgeoning technological activity is the recognition by the business community of the need to develop programming geared to their employees. With that in mind, one can now point to several institutes and institutions who have worked closely with major corporations to develop programming for mid-level executives, entry workers, and for senior executives. These programs have been successful and have continued to grow. We now are finding a further move into the highly specialized and technical programming areas, as exemplified by the WANG Institute. Through its Institute, WANG is now offering graduate degrees, and it is reported that they are seeking accreditation through the New England regional accrediting board. Educational institutions must become more active in recognizing the potential that the corporate and business world offers as both clientele, inventors, and users of tehcnology. A case that clearly points out the need for the education community to become more involved immediately is that of the new broadcasting service called low power television. In September, the Federal Communications Commission proposed rules for low power. The technology has been available since the early 1950s, and has been used to bring television to remote areas by means of "TV translators" (translator being a low power transmitter which rebroadcasts the signal of a distant station, "translating" it to a different channel.) A low power station would be nothing more than a translator permitted to originate programming or to retransmit programming received by satellite or any combination of the two. The Commission proposed initially that perference

be given in the case of competing applications to the first application filed, to nonprofit groups, and to applications from minority-controlled groups. In an attempt to provide for an orderly process in dealing with the applications, the FCC established a cutoff date. They have been swamped by individuals, organizations, and even department stores seeking to apply for licenses, including Neighborhood TV Company (financially backed by Sears Roebuck's Allstate Insurance) which has applied for more than 140 stations, Turner Cable Network and even Bill Cosby. The question remains, how many educational institutions recognize the value of a low power license and the opportunity provided to apply for these licenses?

Among the problems that confront the education community is this inability to seize opportunities and capitalize upon them. Yet other problems exist. One I would consider significant is the lack of uniform hardware and the resultant incompatibility in software. This has been a significant roadblock to the integration of technology in education. Each school system must develop its own programming for the hardware it has purchased or it will find itself unable to utilize software developed elsewhere. For example, there are three major videodisc systems on the market now. Each is incompatible with the others. Is it appropriate for the education community to exercise some muscle to pressure the manufacturers to coordinate their efforts and develop some system compatibility? It is this type of question which confronts school boards as they struggle to decide how much money should purchase which system and that impedes their decisions to an all too significant degree, thus leaving many institutions bereft of the kind of technology that could be a welcome part of the educational process.

Marlowe Froke's paper makes the important point that far more is taking place on the college campus in the telecommunications field than is realized. The utilization of telecourses is most vividly recognized in the community

and junior college area where the senior administration becomes involved in the decision-making as to what courses to offer and how to offer them. In fact, on most other campuses, the increasing utilization of technology is obscured because administrative and academic people don't necessarily relate to those directly involved on the campus with technology. An example of this lack of communication is evident in the paucity of discussion between the very higher education institutions that hold the licenses and the station managers in charge of the licenses. I would venture to say that until that gap is closed, some of the great potential of technology on campuses may not be realized. The only time that the station managers will frequently relate to the institution is to discuss budget. They rarely discuss academic offerings. Most administrators will continue to view technology as an expensive toy and not recognize its importance, for if you were to ask most administrators how their instituions are utilizing telecourses, they will suggest that it is the province of the university extension program. The utilization of television and telecourses needs to be publicized in order to dispel the myth that TV and telecommunications are available only for off-campus instruction and highly specialized and specific programming.

The paper by Walt Radzyminski focusing on cable among other uses of new technology is an exciting door to what lies ahead. At this moment, we could safely say that most administrators are still confounded by cable, much as they were by the whole question of collective bargaining, for in fact, not only do we have the problem of understanding what cable is and what it is capable of doing, we are in the position of not yet having developed programming that can be utilized by cable. Where do we sit in the franchising process? What demands should institutions make? How should they relate to the revenues, etc.? These are all questions with which many of our institutions are currently grappling. Furthermore, there are other new programmatic

and technological developments on the horizon. In February, the FCC agreed to allow COMSAT to enter the home receivership market and develop three major channels. This move was seen by many as several years ahead of its expected approval date. The news media quickly picked up on this. In May the Washington Post ran a lengthly article in its Sunday Magazine on how to purchase a satellite dish, set it up in position to receive certain satellite broadcasts, etc. Home receivership may, in fact, be a far greater revolution than even cable. Clearly, we must demystify the rapidly burgeoning technological revolution for education as a whole.

Finally, it's important to note that while in this administration major changes are occurring financially, there is for the first time emanating from the Secretary of Education clear-cut support for the development and implementation of technology in our schools. We have in Secretary Bell a strong supporter of technology who, while grappling with the problems of student aid and a diminishing department, is a leading advocate for the development of programming for home viewing or utilization within the classroom. His concern is for general improvement in education, and he perceives technology as but one avenue for accomplishing this. He also recognizes that at this juncture, the two-year institutions have had far greater visibility in the field, as they have taken the lead in developing programming and utilizing that programming. The four-year institutions have many different modes for implementing technology but are faced with a somewhat fearful faculty and, in many instances, a reluctant administration. The concerns for a changing student body and for current faculty are all elements that need to be integrated in our review of these monographs.

These papers are timely and necessary and will be most welcome throughout the educational community. Hopefully, this monograph will encourage more risk taking and more in-depth examination of the opportunities that technology offers.

A CASE STUDY IN TELECOMMUNICATIONS AND HIGHER EDUCATION: THE TO EDUCATE THE PEOPLE CONSORTIUM

Otto Feinstein*

The University Studies and Weekend College at Wayne State University was first developed in Detroit in the summer of 1973. It has a number of unique features making it a case study of the positions developed in this monograph:

1. It is a four year bachelor's degree program with 20% of the required courses delivered by television.
2. It has a coherent general education curriculum based on the Meiklejohn-Hutchins-Columbia tradition.
3. It was financed (including the 800 half-hour broadcast TV programs) solely out of tuition revenues, and at one point generated 100 full-time equivalent faculty positions.
4. Within 24 months of conception, it had 3,600 full-time students who were also full-time workers.

These features attracted national attention and resulted in the formation of the To Educate the People Consortium (TEP), a collaboration of higher education institutions, educational television broadcasters, labor unions and faculty organizations. At the time of this writing, it has nine operational models using broadcast television and two using cable. By the end of 1982, TEP anticipates operational models in over 30 institutions including community colleges, colleges and universities, both public and private. Each of these adoptions/adaptations has had to go through the administrative and faculty decision making bodies of their respective institutions.

The TEP experience substantiates what is presented in the three main papers of this monograph. What I would like to do here is to underline some

*Otto Feinstein is Chairman of the To Educate the People Consortium.

points based on our experience. The focal point for this perspective is institutional change in relation to telecommunications and higher education.

Mass Media and Mass Audience

With the exception of some of the media-using community colleges and some of the TEP institutions, the number of students registered for telecourses is usually insufficient to cover the out-of-pocket costs of air time. With the exception of the TEP courses, which were produced out of tuition revenues, no media-using model is able to recoup the initial investment in the development, production, and promotion of telecourses. Unless this condition is reversed, the use of telecourses will never be cost-effective and will require subsidization for both air time and course production. If the purpose is to have existing higher education institutions use the media (rather than creating new institutions based on media), two problems have to be confronted:

1. When experimenting with new practices, higher education institutions generally feel most secure with small numbers of students; this approach makes it most difficult to self-finance out-of-pocket costs, much less air time and production costs.
2. There is a reluctance in most institutions to use courses from other institutions, particularly when dealing with required courses or highly desired electives.

Unless these conditions are changed, telecourse producers and users will be unable to break through the cost-effectiveness barrier. Worse, they will try to cut through by using adjunct and overload faculty, leading to continuous conflict with faculty institutions and organizations.

Our experience has shown that if the focus is on using the media as part of the delivery system for a total curriculum, designed for new constituencies

wishing a degree, and if sufficient funds are invested for recruitment, then the telecommunications aspect becomes cost-effective for all involved. If 30 or more institutions agree on using the same telecourses with their outreach degree programs, a national market can be established which will not only cover the initial costs for the courses, but provide funds for redoing such a curriculum periodically without outside subsidies. Collaboration among most current telecourse users could develop a sufficiently large market to do much more than that. TEP would be most interested to participate.

Cable and Institutional Feudalism

The rapid advent of cable dramatically alters the above situation in two ways: scarcity of broadcast time is replaced (for the moment) with scarcity of programming; scarcity of funds for live broadcasts, interactivity, and tape broadcasting can be resolved by means of the cable franchising process. But here again two problems requiring institutional change present themselves:

1. Cable franchises are given out by communities and the key to higher education channels is multicommunity collaboration requiring interconnected systems and agreements.
2. Mass "audiences" from multiinstitutional course offerings are necessary to sustain even cable economics.

The institutional change required to use cable technology is local, interinstitutional collaboration. The change must be real not simply one of form. This as we all know is not simple. The fact that only credit courses can generate the revenues needed to make telecommunications cost-effective makes this collaboration even within institutions most difficult. If one aims at new student constituencies, however, with a coherent general education curriculum, and full-time faculty, this should be easier.

What is Required?

In order to make the institutional changes which are necessary for use of telecommunications media, a mass market has to be found. There is such a market with full-time workers who want to be full-time students (including over 2,000,000 who have unused tuition rebates), and with current part-time students who could become full-time students if a portion of their program were delivered by means of the media.

If telecommunications is to reenforce the existing institutional structure of higher education rather than creating a private national television university, then some simple but (difficult to achieve) institutional changes are needed:

1. The media needs to be used for part of the core curriculum while assuring an increase of faculty positions.
2. Interinstitutional (local and national) cooperation will have to exist to develop a mass market for telecurricula and cable.
3. Collaborative relations between the higher education institutions, public television, and organizations of potential students will have to be developed.

TELECOMMUNICATIONS AND HIGHER EDUCATION: PROBLEMS AND PROSPECTS

John C. Weidman*

If there is one theme common to all of the foregoing papers and comments it is that telecommunications technology is here to stay, quite independent of any educational purpose that it might serve. People are now able to obtain access to telecommunications technology; e.g., audio, visual, and audio-visual media as well as their various computer-based adaptations, with increasing ease and at rapidly decreasing cost. Whether or not, however, this will lead to a "learning society" of the sort which is ultimately beneficial to higher education institutions remains to be seen.

For instance, suppose colleges and universities rush to offer courses by television once cable systems provide easily accessible educational channels. Will people actually choose to spend their television watching time on courses for college credit? Furthermore, assuming that people will not be billed individually for the minutes they spend watching programs offered for college credit, will most people who watch such programs actually register and pay for college credit? When several members of a family want to watch programs ranging from cartoons to X-rated movies, what priority will ultimately be given to advanced educational programs?

Clearly, people will not have to rely solely on broadcast media. Programs of all sorts can be packaged on video discs or video cassettes and played back through players, some of which are, themselves, computer programmable. Thinking in these terms, collegiate institutions need only develop means of marketing such learning packages in ways that generate tuition revenue, whether for course credit or various kinds of continuing education purposes.

*John Weidman is Associate Professor of Higher Education and Director of the Institute for Higher Education at the University of Pittsburgh.

There remains, however, a question of which institutions or agencies are going to be the producers of the learning packages. Furthermore, if higher education institutions are not the producers, what will the costs be to institutions of leasing and/or buying materials? Entertainment and computer corporations are already producing all sorts of materials for use on their various telecommunications equipment. These products are "slick" in every sense of the word, and it may not be feasible for most higher education institutions to make the expenditures necessary for developing high quality production facilties.

One indication of the magnitude of the costs involved for high quality telecourse production is given in a review of current literature on instructional television by Carol Shulman, who writes that "...a sociology course now in production for the Dallas Community College District will cost about $350,000 to produce and needs an enrollment of about 4,500 to 5,000 in the District as well as leasing earnings to recover its costs over its five-year life."[1]

Even when educational programming suitable for postsecondary audiences such as "The Ascent of Man" and "Cosmos" has been shown on the Public Broadcasting Service stations, the resulting draw of tuition-paying students for institutions has been less than overwhelming. It is true that there are several new initiatives between PBS and higher education aimed at expanding access to higher education; e.g., the $150,000,000 Annenberg Project for stimulating production of high quality programs to serve the needs of higher education.[2] However, the Reagan administration has launched a frontal assault againt PBS's funding from the federal government. It seems unlikely

[1]Shulman, C. H. Instructional television--higher education without commercial interruption. AAHE Bulletin, May 1981, p. 9.

[2]Grossman, L. K. Five partnerships to offset decline--with telecommunications. AAHE Bulletin, April 1981.

that educational programming, without the large federal subsidy under which it has flourished over the past several years, will have as high a priority for stations whose viewers will be expected to pay an increasingly larger share of total station costs.

I'm afraid I've been very skeptical about the net prospects for higher education of the telecommunications advances my co-authors have addressed and which were displayed at our Institute for Higher Education telecommunications workshop last fall. I am not, however, suggesting that the telecommunications technology now available is inappropriate for most higher education purposes. On the contrary, I think the potential is significant. However, as Marlowe Froke points out, institutions must take a serious look at the feasibility of building their own independent production capabilities as opposed to either buying materials generated elsewhere or forming coalitions with higher technology producers of learning materials. Institutions need to assess their own situations very carefully, to weigh the benefits and costs of various uses of telecommunications technology, and then to proceed with the development of strategies based on the knowledge that telecommunications technology will become increasingly available for individual use. The institutional question then becomes, how can individuals be persuaded to use the technology in ways that might also benefit higher education institutions?

ABOUT THE AUTHORS AND CONTRIBUTORS

Randall G. Bretz

Randall Bretz is Director of Mediated Instruction for the University of Nebraska-Lincoln, Division of Continuing Studies. In that position he coordinates audio-visual utilization for the UNL campus, a large film/media library which serves the campus and schools in surrounding states, the use of television and other media to extend the resources of the University, and assists in the planning and implementation of new telecommunications media at the University.

From a background in commercial radio and television, Bretz made a transition to higher education several years ago and has worked in this area in Indiana and Nebraska.

Otto Feinstein

Otto Feinstein, Professor of Political Science and founder of University Studies and Weekend College, is chairman of the To Educate the People Consortium. He is co-author with Frank Angelo of To Education the People, a history of the origins of the program and a detailed description of how to implement it. Copies are available at $3 by writing to him c/o Room 891, Mackenzie Hall, Wayne State University, Detroit, Michigan 48202.

Susan Fratkin

Susan Fratkin is Director of Special Programs for the National Association of State Land Grant Universities and Colleges. She has worked for the Association since 1971. Among her responsibilities is liaison work with the association's sundry committees. She works extensively with the Educational Telecommunications Committee.

Mrs. Fratkin has a B.A. in Political Science from the City University of New York's Brooklyn College, and a M.A. in Political Science from Georgetown University.

Marlowe Froke

Marlowe Froke is Director of Media and Learning Resources in Continuing Education at The Pennsylvania State University. He is responsible for the operation of educational/public television station WPSX-TV, an Audio-Visual Services unit, and an Independent Study Correspondence unit. In addition to his administrative duties, Froke serves as Associate Professor in the School of Journalism.

Mr. Froke has been a featured speaker at numerous state and national meetings concerned with telecommunications. He also edits Continuing Higher Education.

Gerry D. Jordan

Gerry Jordan is Director of Educational Programming for Warner Amex Cable Communications Inc. In this capacity, he has national responsibility for educational programming as it appears in the local cable settings. Jordan is also responsible for program development as it applies to new business opportunities for Warner Amex.

Dr. Jordan began his career in education as an elementary school teacher, and has worked nationally and overseas in various capacities as a consultant. A graduate of the University of Maryland, Jordan earned his master's degree from Johns Hopkins University, and received his doctoral degree from Teacher's College, Columbia University.

Lorita S. Langdon

Lorita Langdon, B.S. and M.A. in English from Ball State University and completing a doctorate in English Education at The Ohio State University, has taught in various settings for twenty-five years. She has been Chairperson of the Communication Skills Department at Columbus Technical Institute, Columbus, Ohio, (a two-year, state supported school) for the past eleven years during which time the department has won awards for being progressive and innovative.

Ms. Langdon, a founding member of the Higher Education Cable Council, has produced several telecourses for use on cable, has been on-camera talent for a business communications telecourse, and presently appears live four times a quarter on QUBE's interactive segments on QUBE Campus. She has worked extensively with business and industry as a communications consultant and with Warner Amex's QUBE since 1978, both in education and public programming, including the "Book Club," an interactive panel discussion of best sellers in conjunction with the Columbus Public Library. She has presented many workshops around the country promoting telecommunications and other alternatives to the classroom.

Joseph G. K. Miller

Joseph Miller has announced his retirement as the Executive Director of the Pittsburgh Council on Higher Education after ten years incumbency. A leader in Pittsburgh civic affairs, he has also received recognition as a contributor to the ational onsortium scene by serving as an officer of the Council for Interinstitutional Leadership.

His earlier career was in the U.S. Army for thirty years during which time he participated in two overseas wars. He studied at the Field Artillery School of Fire, the Command and Staff College, the National War College and he taught at the U.S. Military Academy and the U.S. Army War College. He is proud of his ancient certificates in "Officer Equitation" and "Graduate Horseshoeing"--which are not common these days. His current aspiration is to qualify for a new one as "Trout Fisherman, Third Class."

Herman Niebuhr, Jr.

Herman Niebuhr, Jr., has had a varied career as psychologist, urbanist, university planner, and most recently, as designer and advocate of changes in the system of human learning and development. He is Associate Vice President and Assistant to the President at Temple University, Vice Chairman of CLEO, the consortium of colleges and universities in the Philadelphia region, and Commissioner, responsible for long-range planning, of the Pennsylvania Public Television Network Commission.

Walter J. Radzyminski

Walter Radzyminski is a graduate student in the Higher Education Program at the University of Pittsburgh. His specialization is educational utilization of telecommunications. Currently he is conducting Ph.D. dissertation research involving analysis of cable communication educational access policy provisions promoted in major metropolitan market franchise proceedings.

Mr. Radzyminski has a B.S. and M.Ed. from the University of Cincinnati. Prior to entering doctoral studies he taught in a variety of secondary education settings.

Michael B. Spring

Michael Spring currently serves as Acting Director of the University External Studies Program at the University of Pittsburgh. Prior to assuming the directorship, Spring served as Associate Director of the Program for six years. He also worked for the Program as a curriculum designer. He received his B.A. in psychology and education from the College of the Holy Cross and his Ph.D. from the University of Pittsburgh.

Dr. Spring has served on numerous committees at state and regional levels concerned with promoting the use of cable and broadcast television by the higher education community. He serves on the editorial boards of Continuing Higher Education and Media and Adult Learning and has authored papers on higher education and telecommunications. His involvement with community organizations includes services as President of the Board of Directors of the School Volunteer Association of Pittsburgh, Inc., and Vice President of the Board of Directors of an arts-in-education group called Imaginarium, Inc.

John C. Weidman

John Weidman has been Director of the Institute for Higher Education at the University of Pittsburgh since January of 1980, and an associate professor of higher education since January of 1979. A sociologist, he is interested in individual and institutional factors in the development of higher educational policy, and has published articles on higher education curriculum, social program evaluation, and policy analysis.